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# GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CLXVIII. No. 3214.] LONDON, DECEMBER 17, 1924. [76TH YEAR. PRICE 1s.



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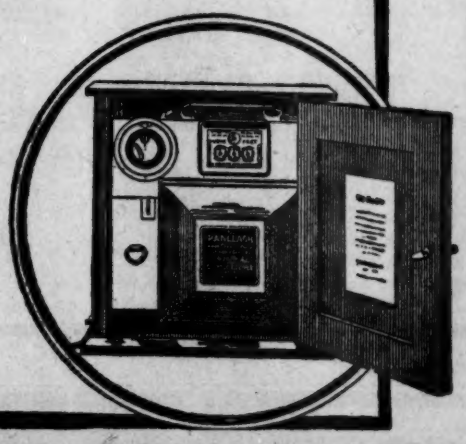

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VOL. CLXVIII., No. 3214.] WEDNESDAY, DECEMBER 17, 1924. [76TH YEAR.


## EDITORIAL NOTES.

### Parliament and Industry.

THE Sixth Parliament of His Majesty's reign was opened on Tuesday of last week; and we all hope that this inaugurates a period of stability and of freedom from the political vicissitudes and uncertainties experienced in recent years. The country has had enough of the feeling of insecurity which has been its lot, and particularly during the tenancy of office by a Labour-Socialist Government. We all know to what that led—we know of the intrigue in high places, whereby a fairly moderate Labour-Socialist Government became the servile puppets of extremists, owing to the pressure they were able to exercise. No country could hope to progress under such conditions. The only way is by engendering a feeling of security in industry and trade, and for the Government to assist by doing everything that can be done legitimately and reasonably. Those conditions can only be brought about gradually by having a strong party in power, without inflated desires for so-called social reforms and large State-aided schemes which the theorists and the moralists believe would have a regenerating effect upon our national affairs, and in fact bring the millennium to a restless world. The plans were not of an order that commended themselves to experience and practical minds. They do not fit in with the system of things as we know it; and instead of being constructive, they would have been destructive.

The nation has to rely upon industry and trade; and industry and trade want to develop along orderly and sane lines. All they desire is that everything rationally possible should be done to place them upon terms of closer equality with manufacturers and traders abroad. Those terms cannot be level in their entirety owing to the differences in the internal, fiscal, labour, and other conditions of one country and another. But anything that can be done to ameliorate British conditions will be welcomed. Industry has rejoiced over the recognition in the Speech from the Throne of the hindrance to it inflicted by the heavy burden of taxation. There is promise that every effort shall be made to reduce public expenditure to the lowest possible limit consistent with the security and efficiency of the State. "The present heavy burdens of the taxpayer are a hindrance to the revival of enterprise and employment. Economy in every sphere is imperative if we are to regain our industrial and commercial prosperity." Miracles in these respects cannot be performed; but there is satisfaction in knowing that the Government intend to attack these ponderous problems, and to do all possible to bring about relief, which at best can only be gradual.

His Majesty noted the signs of improvement in the state of trade and industry. Signs of this kind are only indicative of something which may be temporary or permanent. What is wanted is a substantial materialization which will give the country the feeling of permanent improvement. The fact that no very large materialization has taken place is reflected in the present extent of unemployment, despite schemes specially fashioned and inaugurated to bring about the absorption of labour. The extent of unemployment continues to cause His Majesty grave concern; and this is not surprising. We are very much afraid that unemployment will remain at a high level until British industry is invested with better economic conditions. That is where the improvement must begin. But His Majesty is hopeful that more stable economic and political conditions throughout the world, and the greater development of facilities for inter-Imperial commerce, will promote the growth of both our internal and our overseas trade. There are indications in this that the Government intend to undo some of the work done by their immediate predecessors. We have evidence of it again in the statement that "a Bill is under consideration, and will be submitted to you at an early date, for safeguarding employment in efficient industries where, after inquiry, the need for such exceptional action is established." But all that the Government can do by diligently attacking those problems that impede the advance of industry will have its efficiency reduced if there is not, "among all parties concerned in the industrial life of the nation, increased goodwill, frankness, and mutual confidence." Without these, "full advantage cannot be taken of any improvement in other conditions." But we are afraid that, while our trade unions are so highly dominated by an ultraist element, those conditions necessary to industrial revival and progress will not be fully realized. Unfortunately, the extremists are opposed to goodwill, frankness, and mutual confidence.

### Bills in Parliament—Progressive Innovation.

OBTAINING new powers by Gas Bills, unless absolutely necessary, has fallen somewhat into disfavour, since for most purposes Special Orders provide satisfactory and expeditious means, at moderate cost, of supplementing powers. Through this it is not at all likely that we shall ever see a return of the days when each new session of Parliament brought a number of Gas Bills which occupied, over several months of the year, and in variable degree, the attention of the authorities and of Select Committees of both Houses. Numbers have shrunk badly. We do not regret this; it is a good thing, as much of the costly contention of years ago over quite ordinary Bills was, as it is looked at from the standpoint of to-day, very frivolous. Many of the matters over which there was wordy fighting have been banished from place and part in the operations of the industry; regarding many of the proposals there was grave postulation that, if granted or disallowed by Parliament, the interests of the public would suffer beyond measure. The years have rolled by, and nothing untoward has happened therefrom. There was then in the industry more concern over the parliamentary contests than over such questions as the thermal or commercial efficiency of carbonization or of gas in use, or the influence of service among the consumers. The gas industry has changed its coat, and has altered its interests and its ways. We must give the Gas Regulation Act its due. At one sweep it has removed much that was formerly controversial, and has set up a practical and commonsense method of doing many things.

Perhaps in time we may develop upon this—not in the same direction, but in others. In the electricity industry, for instance, there is what is called "interlinking" between one concern and another, whereby peak loads are met without additional capital expenditure by the purchase of current in bulk; and by the same means neighbouring undertakings are able to take turns in some areas in meeting the Sunday load without keeping an unnecessary number of separate plants running. Similar "interlinking" is not required in well-ordered gas undertakings with a comfortable storage capacity, because it is possible for them to accumulate a sufficient stock of gas to enable a break to be made from Sunday labour—maybe not in all cases in a week of dense fog such as the last one, but normally. These conditions, and the possibility of an extension of gas policy in a new

direction, have crossed our mind owing to the character of the notice of a Bill given by the South Metropolitan Gas Company, which appears to indicate "interlinking" for the promotion of economic conditions. They intend to obtain authorization to agreements or arrangements between them and other gas companies for the use of, or participation in the use of, or in any advantages obtained from, premises, plant, organizations, operations, or other facilities belonging to, or provided wholly or partially by, the Company in relation to the manufacture and sale of gas or the secondary products, or of moneys, and to make provision for the supply of gas in bulk. This all implies a better utilization of capital and plant to the advantage not only of the Company, but of other gas undertakings. The notice goes farther than that. Provision is to be made for the satisfaction of any consideration payable by any company under any such agreement by shares, stock, or securities; for empowering the Company to take over or acquire, or exchange, stocks or securities for, shares, stock, or securities of, or to lend money to, or to acquire interests in, any other company carrying on business as a gas company, and to apply money or issue stocks and securities for such purposes. Power is sought for the formation of joint committees of the Company and other companies, and for representatives of the other companies becoming directors of, or otherwise associated with, the Company. We will not at the present stage attempt to interpret the meaning of all this, but content ourselves by waiting for the fuller information which will be afforded by the Bill itself when available. But clearly there is innovation here, which proposes to carry the operations of a gas company in a new direction, with the view of promoting mutual economy and efficiency. If that is so, why not? Gas supply is a public service; the greater the economy and efficiency with which it is conducted by any legitimate means, the better for the public. A progressive industry such as gas supply cannot always follow the orginal route as mapped out legislatively in less enlightened times.

There will be another imposing measure for the attention of Parliament next year. That is the promotion of the Gas Light and Coke Company, by which it is contemplated to absorb the Brentford Gas Company and the territory now supplied by it. Here again, the economies that the larger Company can introduce owing to its plant and geographical conveniences in respect of the river will no doubt take a prominent place in the argument advanced in support of the amalgamation scheme, which, as we have previously pointed out in these columns, will make that which is great much greater—in every direction. This annexation by the Gas Light Company will be the largest on record in the gas industry. Among minor proposals, the Bexhill Council are contemplating the purchase of the local gas undertaking; and the Hoylake and West Kirby District Council have like intentions respecting the Company at present operating in their area. The Stockton-on-Tees Corporation are proposing to extend their area of supply, and to acquire the Haverton-Hill-on-Tees Gas Company. The Wallasey Corporation want a small part of the distribution system of, and the area supplied by, the Hoylake and West Kirby Company; the Burnley Corporation are seeking to purchase the plant in a portion of the Padiham area; and the Rhymney and Aber Valley Gas Company are going to take over the distributing works, &c., in a piece of the Bedwellty District Council's territory—the enabling clause being in a Bill promoted by the latter. The Gas Companies supplying Horley and Uckfield are moving for electricity powers. Other notices [*ante*, p. 666] indicate ordinary authorization, and for the most part constitute small sections of Bills promoted by local authorities.

## Fog and Gas Consumption.

LONDON last week experienced the worst fog it has had for years. Complete darkness reigned for hours together; but nevertheless it was not of that intense "pea-soup" brand that used to be the fashion before gas and coke brought their alleviating influence to bear upon the fogs. The infliction began at 9 p.m. on Tuesday, and moved off at 11 p.m. on Thursday. During that period, there was an enormous demand for gas on the north side of the Thames and in the east-end of London, and probably the same could be said of other London areas. The Gas Light and Coke Company and the Commercial Gas Company made fresh records in output—in fact, Wednesday's output of gas by the former was no less than 29,310,000 c.ft. more than it was on the Monday of the same week. The outputs from Monday, the 8th, to Thursday, the 11th, were as follows: Monday, 134,572,000 c.ft. (air temperature 45°); Tuesday, 142,825,000 c.ft. (44°); Wednesday, 163,882,000 c.ft. (40°); Thursday, 163,004,000 c.ft. (37°). The maximum output at midday Wednesday, when the lighting, heating, and cooking loads were at a peak, was over 12 million c.ft. per hour. As a comparison, in November, 1923, with cold foggy weather, and a temperature of 32°, the output reached 156,763,000 c.ft. in one day, and a little later—in January this year—with cold snowy weather, 156,373,000 c.ft. Contrasted with the higher of these two figures, last Wednesday's output of gas exceeded it by 7,119,000 c.ft.

Regarding the Commercial Gas Company's experiences in the east-end of London, on Wednesday there was an increase of consumption of slightly over 12 p.ct. on the corresponding day of last year. The output on Thursday was the heaviest in the history of the Company—viz., 18,083,000 c.ft. The previous maximum output was on Dec. 8, 1920, when it reached 17,185,000 c.ft.

The figures evidence the tremendous increase that is being made in gas-consuming points for all purposes affected by low atmospheric temperatures and darkness. We wonder how our electrical friends would like to be called upon to meet such enormous differences in demand. On the declared calorific value of 500 B.Th.U., the quantity of gas sent out by the Gas Light and Coke Company on Wednesday was equivalent to 81,941,000,000 B.Th.U., or 819,410 therms. The difference in the thermal value of the outputs on Monday and Wednesday was 14,655,000,000 B.Th.U., or 146,550 therms. To equal the thermal value of the gas sent out on Wednesday by the Gas Light Company alone, the electricity suppliers in the same area would have had to supply 23,959,357 KW.-H. Such sudden flights in the demand for heating on top of the maximum lighting load would not be a matter of comfort for the electrical systems.

## The Attacks on the Road Rights of Public Utility Concerns.

THERE is confidence that every gas company, and we hope every municipal authority owning a gas undertaking, will stand steadfastly behind the National Gas Council in their defence of the existing legal rights of public utility concerns in respect of their distributing property in roadways. The position has now become critical; and the Council will need to be solidly backed by all the influence that can be exercised by the undertakings in whose interests they are acting. All the utilities affected—water, gas, and electricity—have a strong case, the gas industry particularly so, against any infringement of their existing rights. Apart from the fact that gas undertakings pay heavily in rates in respect of their property reposing in the subsoil of roads, they are engaged in a service beneficial to the public not only through the constant provision of a labour-saving agent for light, heat, and power, but in promoting the conservation of coal and the purification of the atmosphere of our cities and towns. Moreover, the underground conveyance of their primary commodity advantageously affects the use of the surfaces of roadways, and so reduces wear and tear by traffic, and traffic congestion in populous areas. These things must not be forgotten as approach is made to the consideration of the claims put forward for altering the present law as to the use of roads as against public utility concerns and in favour of highway authorities, and now in more ways than one.

The matter was before the Central Executive Board of the National Gas Council at their meeting last week, and the minutes published in later columns disclose the fact that the County Councils have developed their ideas of what should be done in placing absolute authority in their hands, and making public utility concerns entirely subservient to their wishes and decisions. Against that, and in defence of their statutory rights, public utility concerns must make a resolute stand. There are now two questions *sur le tapis* directed to altering the legal rights of gas undertakings—one affecting the costs of removing pipes or wires when street alterations are in hand; the other proposing to divest public utility concerns of all discretion as to the future laying of pipes, and to place it completely in the hands of the highway authorities. There is also an additional new phase as to conditional "permission" to break open roads for the purpose of pipe work, which proposes to absolve the highway authorities from liability, and to give them control in the depth of pipes.

Regarding the first matter, there have been one or two attempts by county councils to deal with it in individual

cases; but it was brought to a climax when the London County Council passed a resolution expressing the view that the grant to private statutory companies of the right to use public streets without charge for the purpose of laying down pipes or wires ought not to involve obligation upon local authorities to keep such streets unaltered for ever, or, if they be altered, to bear the cost of any necessary removal and relaying of pipes and wires. The "without charge" part of the resolution has naturally been objected to in view of the actual facts as to the continual revenue producing value of such mains to the local exchequer; and there has also been protest against any alteration of the law as to the expenses incurred in removing and relaying pipes or cables when this is necessitated by street alterations which the road authority desire to carry out. There is no objection whatever on the part of public utility undertakings to street and road alterations being made which will be of public benefit; but they hold that the cost of any changes necessitated in the position of pipes or cables should be, as now, part of the cost of making a public improvement. It is not the owner of the pipe or cable that desires the removal and relaying, but the street authority. If there is any attempt to introduce legislation to alter present practice in this regard, public utility undertakings will take joint action in opposition. This matter has not advanced beyond the stage indicated. It may be the subject of a further conference; but we are now at the opening of a new session of Parliament, and a narrow watch will have to be maintained for any movements in this particular.

For the second point the County Councils Association are reponsible. The minutes of the Central Executive Board of the National Gas Council put the matter in a nutshell. The proposals are, in effect, "that the existing law which granted to statutory undertakings the right to use public streets for the purpose of laying down pipes or wires should be entirely reversed, so that, instead of there being a certain amount of discretion in the hands of the undertakers with regard to the laying of such pipes or wires, in future the discretion should be absolutely in the hands of the highway authorities." To those conditions there must be stern resistance. No one can better decide (within the limits of their present rights) than the technical advisers of public utility concerns as to the conditions, having regard to the characteristics of the roadway, which will best serve the public interests. The best competence in the matter of decision and discretion rests with such concerns, and not with the county council. The law has recognized this; and there is abundant proof that—at any rate, with gas undertakings—due regard in all new pipe layings has been had to the modern conditions affecting the construction and the use of the surfaces of roadways. However, perhaps further comment had better be deferred until there are developments, in view of the prospect of conference between the County Councils Association and representatives of public utility concerns. But there can be no abatement of the resolve not to forego any legal rights now possessed. It would be interesting to learn something of the character of the case upon which the Association base their desire to reverse the present position and give the highway authorities absolute discretion. It is noted that the Association consider the time has arrived for a comprehensive inquiry into this matter, either by Royal Commission or Departmental Committee. We expect the Government will be too busy for some time to come to give attention to a matter of this kind; but, should an inquiry be held, the public utility concerns will be able to put up a good case in opposition to the proposals.

The attempt to evolve greater powers of control by county councils over the statutorily authorized users of the subsoil of roads is further attested by the receipt by gas undertakings from road departments of county councils of a form of application to be used when asking for "permission" to break up the roads and reinstate trenches. This permission is only to be granted conditionally. In short, the desire is that gas undertakings who make application should shed all their legal protection and place themselves unreservedly in the hands of the county councils. The latter wish to be relieved of all liability; to them is to be confided the determination of the depth at which pipes are to be laid; they are to have sole discretion as to the weight of steam-rollers; and so on. The attachment of county councils to one-sided arrangements appears to be growing luxuriantly, even to the extent of going beyond the powers they possess. There is a higher authority than the county councils, and that is Parliament; and Parliament retains the right of prescribing how far county councils may go, and how far the obligations of public utility concerns are to extend, and their rights in carrying on their public services to be protected. The National Gas Council advise gas undertakings who have received these forms of application for permission not to comply with them, on the ground that they are *ultra vires*. We hope there is not a single undertaking that will be weak enough to give way to the demands. On the contrary, there is certainty that in these matters the gas undertakings will stand solidly at the back of those who are doing all possible to guard their long-existing interests in these important matters.

## "All-in" Service—Co-operative Training.

THE article in last week's issue on "Organizing Good Service," which was prompted by Mr. Sandeman's paper before the Southern District Association of Gas Engineers, has brought a letter from Mr. W. W. Townsend, of Colchester, which is highly encouraging and suggestive. Our correspondent is one of the early advocates of maintenance of all appliances in consumers' houses; and he believes, as we believe, that this is the ideal to which to aspire. If all responsible gas men would adopt that ideal, even if at present they cannot attain it, it would be an inducement to them to get on to the road leading to it. When once on a road with an ideal as an objective (although realization at first seems far off) it is wonderful how progress towards it is made. We are not given as a rule to prognostication; but from constant observation of the trend of events, we do feel confident that, despite the present *non possumus* attitude of many gas men, what is regarded to-day as an ideal will become common practice in future. Compulsion will enthrone it where foresight has not brought about its institution. In addition to those who advocate and practice inspection and maintenance on systematic lines, there are a considerable number of gas managers who believe that the development of new competitive conditions has advanced the need of the policy of inspection and maintenance, and yet they make no effort to establish it. But they should be easy converts to the ranks of those who long since were persuaded that the "all-in" policy of inspection, adjustment, and maintenance—apart perhaps from the cost of replacements in privately owned appliances—so ensuring efficiency and economy, is the best possible protection of the interests of their undertakings.

The reasons for reticence in moving forward are three: There is, as Mr. Townsend points out, first the increasing business which tends to encourage the comfortable reflection that all is well; there is the cost; and there is the difficulty of obtaining qualified men. Those who live in a Fool's Paradise keep wisdom outside the gates. The more valuable a business becomes, the greater the responsibility to protect it by every reasonable means within our power. As to the cost, we have it from those with experience that it amounts to a fraction of a penny per therm. Dissatisfaction at 7d. per therm is not so good as satisfaction at 7·25d., 7·5d., 7·75d., or even 8d. per therm. As to the men, Mr. Townsend offers a suggestion, which should receive serious consideration. He says: "Most undertakings are already "training apprentices; but personally I am of the opinion "that the problem is so large that it will never be properly "solved without a co-operative effort, and that it will be-"come necessary to establish training centres in various "parts of the country at which intelligent youths can be "instructed by the hundred to fill the demand which is "bound to come." That is a constructive proposal; and, being such, it should command attention throughout the industry. If it is considered practical, it ought not to be difficult to give it a trial; and then, if successful, there could be application at convenient centres throughout the country. Enthusiasm in this matter is only scattered in the industry; and there is very good reason for the view that every day of deferment of a more definite general move is a day absolutely wasted. One more quotation from Mr. Townsend's letter: "It is to me surprising that "gas undertakings should spend thousands of pounds "on elaborate showrooms designed to convince the public "of the merits of gas, and that they should then grudge "expenditure in the houses of the consumers themselves, "where the impression produced is ten times more impor-"tant." The last nine words should be read slowly and emphatically. If they sink well home, the policy of "all-in" service will have made a big stride.

## Ironmongers and Cheap and Inefficient Gas Appliances.

There has been occasion in the past to refer to the need of education as to gas utilization among ironmongers who deal in gas lighting fittings and heating appliances. This does not apply to them all, some happily being blessed with more intelligence than others. Where those with the lower grade of intelligence fail in this particular is in thinking that their business is to supply what people want to buy. Some people will purchase anything that looks cheap, regardless of safety or anything else. And the trouble is that there are ironmongers who will pander to this sort of thing, and push completely aside all question of there being any obligation on their part not to sell goods of a quality or design which are dangerous to the public. Some time ago, there was the resolution from the Bristol district ironmongers' organization, protesting against the Gas Company's action in connection with flueless heating appliances—such as geysers. No such resolution would ever have been passed had the ironmongers concerned been better acquainted with the subject, but both the resolution and the arguments which enveloped it showed crass ignorance. Fortunately, those who passed it did not represent the views of all retail traders in these particular goods. "Safety first" and "quality" are really synonymous terms when speaking of gas appliances; and this is recognized by the more reputable ironmongers.

We are led to return to the subject by correspondence which has appeared in the "Ironmonger," and in which the existence of diametrically opposite views as to quality and safety is strongly emphasized. There is one writer, who uses the initials "H. M. T.," who counsels his fellow traders to stock only "a mere sample of fancy pendants;" and to "concentrate rather on such goods as cheap wall brackets, flexible pendants, and the like." Also that "stock generally should be bought from factors for the higher-priced goods, and in case lots from abroad for the cheaper lines." The advice is deplorably bad. We are afraid that not a few of the gas accidents that have occurred in this country have been due to those cheaply produced continental goods made from thin seamed tubes, which after a time, through deterioration or perhaps through an accidental knock, open out at the seam, and allow gas to escape. Cheap fittings, adapters, and burners are really expensive in more ways than one; and ironmongers would be best serving the interests of their customers by telling them what is demonstrably true, that the slightly higher priced articles are more economical, efficient, and safe, and therefore cheaper in the end. We therefore heartily agree with another writer—"C. P."—that "H. M. T." gives mischievous advice to fellow traders, through considering cheapness first instead of quality, and with "Safety First," who emphasizes the danger of cheap and shoddy fittings. "C. P." also declares that, "with a few exceptions, ironmongers do not know a properly-made fitting when they see it." We did not know the position was as bad as that. If it be true, then in the interests of the gas industry and the public alike, there is need for a little technical education in that quarter.

The ironmongers of the country will be well advised not to overstock themselves with cheap and shoddy fittings. We are inclined to think that their death-knell will be heard before long. The ironmongers do not appear to be in close touch with present movements. Their mentors should advise them. In Mr. W. J. A. Butterfield's recent report to the Board of Trade, he recommended that the gas industry should be asked to submit to the Board suggestions for a system of periodical inspection, and of maintenance in safe condition of gas piping, fittings, and appliances in dwelling-houses. This is accompanied by a further recommendation which should be particularly noted by ironmongers:

> That the gas industry be asked, after conferring with the makers of gas fittings and appliances, to submit to the Board of Trade proposals for the elimination from the trade of (1) types and qualities of fittings, &c., which are liable, after a few years' use, to become unsound or otherwise unsafe; and (2) flueless heaters or other appliances which are apt to evolve carbon monoxide. Also to submit proposals for preventing geysers, &c., being fitted in very small rooms without adequate and trustworthy vents to the open air for the products of combustion.

Upon these recommendations the Board issued, through the National Gas Council, an invitation to the gas industry to submit suggestions and proposals; and a Committee has been formed for the purpose. This is a development of a course of events the end of which will, we anticipate, have (from their point of view) a detrimental effect upon those ironmongers who are dealers in cheap, shoddy, inefficient, and unsafe gas-consuming goods. From our point of view, such an effect will be beneficial. There will have to be a compulsory mending of their ways, for consumers are not likely to buy those things which they will not be allowed to use. In our opinion, those ironmongers who have been engaged in vending low-quality and inefficient gas appliances have done harm to the gas industry and to the public, and are the chief cause of the recommendation quoted.

### Christmas Holidays.

Will all correspondents kindly note that, in view of the Christmas Holidays, it is intended to deliver next week's "Journal" to the Post Office for mailing, and to the Wholesale Houses for distribution, half-a-day earlier than usual? We shall, therefore, be glad if communications intended for that issue are forwarded as promptly as possible—at latest so as to be received at this office by the first postal delivery on Monday morning.

### Industrial Salesmen's Circle.

Through the instrumentality of the "B.C.G.A.," a valuable development has been made in the Gas Salesman's Circle movement. The applications of gas in industry constitute a "job" for specialists, although admittedly in districts where there are few industrial establishments there is not room for a gas salesman with special qualifications in this direction. In such cases, the salesman whose major work is to deal with the domestic side of the gas business has also to be capable of not losing opportunities of giving advice and obtaining business on the industrial side. But there is large scope for industrial gas specialists having a Circle of their own, and coming together to give each other the benefit of experiences and suggestions. Therefore we welcome the formation of such a Circle. The proceedings at the inaugural meeting are reported on a later page.

### Mains of Insufficient Capacity.

It will be remembered that the difficulties that had arisen between the gas industry and the railway companies over the "mains of insufficient capacity" clause were fully threshed out when the Pinner Gas Order was before a Commons Committee at the end of last July [see "Journal" Aug. 6, p. 524]. The Committee then adjourned the matter over the parliamentary recess in the hope that the parties would endeavour to draft a clause which would meet the position as it had been left as the result of the proceedings. Both the railway companies and the gas interests gave assurances that they would do their amicable best. A draft clause has been agreed by the officers of the National Gas Council, the Parliamentary Agents, and the Pinner Company; and it was submitted to the railway companies for their approval about the middle of November. But up to Tuesday of last week, nothing had been heard from them. Nevertheless, the National Gas Council expect that before Parliament meet in the spring, the clause will have been agreed. It is devoutly hoped the expectation will be fulfilled.

### "N.U.R." Claims.

The National Union of Railwaymen have put forward a programme for improving the wages and conditions of 150 grades of their men—numbering some 650,000, including the railway shopmen. The estimate of the "N.U.R." is that the granting of the increases would mean an additional £10,000,000 a year to be found by the companies. But critics assert that this is considerably below the actual cost, as, calculating on a rough average of only 30 p.ct., the extra burden would more likely work out to £30,000,000. Whichever sum is true, the proposal is a startling one, and will no doubt create visions of extra expenditure in conveyance—passenger and goods. It is too early to speculate upon this. Already the machinery has begun to move which has been designed to deal with such matters in the railway world.

### Economic Conditions of the Coal Industry.

The Mining Association recently issued an invitation to the Executive of the Miners' Federation to discuss a proposal to ap-

point a Joint Sub-Committee of representatives of owners and miners to investigate the economic conditions of the industry, and to suggest remedies for the prevailing depression. The invitation has been accepted; but the Miners' Executive have made it plain that their attitude is entirely a non-committal one.

### Trade Unions and Communism.

Is it true the trade unions of this country are now represented by supporters of the Soviet Government? There are claims that it is. From Tiflis comes an account of the welcome given by the Georgian Communists to the delegation of the British Trade Unions. There was a demonstration; and Mr. Tillett is credited with greeting the demonstrators with: "Long live the proletarian revolution!" Mr. Bromley is also reported to have said: "Neither MacDonald nor Snowden nor Shaw has ever been representative of the British workers, but only of the Second International. Therefore, the British workers are not responsible for what they say. Through the trade unions, we are the real representatives of the British workers; and we declare that we support the Soviet Government." We hope the report is not true.

### Power Alcohol from Beet.

The use of power alcohol mixed with benzole as a motor spirit has long been advocated; but the difficulty has been the home production of the power alcohol. Report says that widespread interest has been aroused among agriculturists throughout the country by the proposals made by the principal motoring bodies and others in a deputation to the Minister of Agriculture last week, that the subsidy on sugar produced from British-grown beet should be extended to power alcohol produced from the same material. No assistance in the way of Government capital is asked for, as was required in the case of beet sugar; and it is believed that areas can be brought under cultivation for beet for power alcohol in a comparatively short period. There are no patents or other restrictions either in power alcohol or in the distilleries and plant that will prevent any group from producing their own supplies of power alcohol; and such distilleries will always yield in the way of bye-products as much cattle food as results from the treatment of beets for any other purpose. With the extension of the subsidy to power alcohol, the industry, it is stated, will be able to pay to the farmer 44s. per ton for beets of 15½ p.ct. sugar content. Careful calculations have shown that, with this initial encouragement for the period of ten years, it would be possible to establish on a permanent basis an invaluable source of motor spirit; thus helping to reduce our present dependence on foreign countries for supplies.

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**Tar-Treated Concrete.**—Investigations carried out by the United States Bureau of Public Roads on the water-proofing properties of water-gas tar have, says the "Scientific American," indicated the possibility of utilizing this material as a means for protecting concrete from the action of saline solutions. It has found that crude water-gas tar having a specific viscosity of from 6 to 12 will enter freely, under atmospheric pressure, into dense concrete and mortar, and is largely absorbed by the hydrated cement. Cement drain tiles so treated have shown no signs of disintegration under test.

**Gas-Works Directory and Statistics.**—There has been received from the Business Statistics Company, Ltd., of Cardiff, a copy of the "Gas-Works Directory and Statistics for 1924." This is the fortieth issue of the series, the thirty-ninth volume of which was published by Messrs. Hazell, Watson, and Viney, Ltd., eight years ago. The new issue is on the lines of previous ones, which were well known to readers of the "JOURNAL." As before, it is divided into four sections—England and Wales, Scotland, Ireland, and Foreign and Colonial. Useful information is included with regard to more than 1500 undertakings. The price of the book is 10s. 6d., or post free 11s. 3d.

**Christmas Help.**—A new issue (No. 130) of the British Commercial Gas Association's "A Thousand-and-One Uses for Gas" shows in operation a number of small gas appliances, any one of which given as a present would result in a sincere word of thanks from the recipient. If the gift is for a smoker, what better than a charming little cigar and cigarette lighter with ash tray combined? If for a girl friend, she can have a small nickel-plated curling-tongs heater, which can be connected to the nearest gas supply pipe. If for a bachelor girl who prefers to iron-out her blouses, and so forth, would she not jump at a beautifully polished internally-heated gas iron? Even man is catered for. He can have a portable gas heater in his workroom, or a special boiling ring fixed up near his work-bench, so that he can heat-up the glue. These are a few of many interesting suggestions.

## PERSONAL.

Mr. B. R. GREEN, following the usual custom of a newly-appointed member of the Board of Directors, contributes an article to the December issue of the "Co-Partnership Journal" of the South Metropolitan Gas Company. In this, he says he looks back to the time when he held an official position with the Mitcham and Wimbledon Gas Company, now part of the Wandsworth, Wimbledon, and Epsom District Company; and it is a proud thought with him that, just before this amalgamation took place, he had succeeded in persuading his chiefs of that time to adopt the South Metropolitan system of co-partnership. He is still associated with the Board and the Co-Partnership Committee of the united undertaking, and also with two other Companies where the system flourishes—namely, the South Suburban Gas Company, who have enjoyed upwards of thirty years the privileges attaching to the scheme, and the Aldershot Gas, Water, and District Lighting Company, where the principles of the movement are enthusiastically upheld.

The Scottish Society of Arts have awarded a Keith Prize, value £20, to Mr. R. MACLAURIN, for his paper on "Carbonization of Coal for Smokeless Fuel and Industrial Gas." An award of £85 was also recommended for Mr. C. N. KEMP, to continue his X-ray work on coal.

## OBITUARY.

Deep regret will be felt by a very wide circle of friends, and especially by his old colleagues at the works of the South Metropolitan Gas Company, at the news of the death on the 13th inst. of Mr. CHARLES FOARD FRANKS. He passed away, after an operation, at his residence, No. 10, Woodville Road, Blackheath. Mr. Franks was a member of the Institution of Gas Engineers and of the Society of Chemical Industry, at the meetings of which, as well as at those of the Southern Association, he was, until ill-health overtook him, a regular attendant. With his technical knowledge was combined an attractive personality which rendered his presence welcome on all occasions.

Alderman GEORGE DAVIES, J.P., of Widnes, father of Mr. J. Davies, who recently resigned the position of Gas Engineer at Oswaldtwistle, passed away suddenly on the 12th inst., in his 75th year. Alderman Davies was a leading citizen, and an ex-Mayor of the borough.

The death occurred on the 12th inst., at Rickmansworth, after a long illness, of Mr. CARL DELLWIK. He was 62 years of age.

## ELECTRICITY SUPPLY MEMORANDA.

**The Late Government and a Subsidy.**

No one knows yet how far the new Government will support or reject the proposals of the late Labour-Socialist Government to afford the electricity industry preferential assistance in connection with the development of its business; but we decline to believe that the present Government will be prepared to tread in this respect the path of folly upon which their predecessors had set their feet. As various references in the "JOURNAL" have shown, the late Government were fairly well advanced with their plans for friendly succour to the electricity industry. The offer was made through the Electricity Commissioners; and conferences with various electrical organizations were held by that body. The ambition of the Labour-Socialist Government was to promote electricity supply service throughout the kingdom, even in places where there was little chance of commercial success. Mains and feeders were to be carried into outlying and rural areas, although the financial aspect was not encouraging. To overcome this little difficulty of people engaged in rational commercial enterprise, the Government proposed to guarantee the interest on the capital invested during a period limited (say) to ten years, or until the scheme was remunerative, whichever was the less. The electrical people, who are always keenly willing to take everything and anything which will be advantageous, regarded the terms as too indefinite for the blessings of the service they were to provide, and they therefore desired the offer to take more exact form. The Electricity Commissioners invited them to submit concrete schemes; and, if they would do this, the hint was given of anticipation that the Government would agree. So far as rural areas go, the objections are to the Government taking financial part in such speculation with the taxpayers' money, and to one trading industry being backed by national money to the detriment of a competing trading industry. The proposals, however, appear to have extended to a larger area than rural suppliers. According to one interpretation of them, they covered not only main transmission cables and overhead lines in small townships and villages, but (where legal powers exist, and the undertakers wished) the wiring and equipment of premises. On behalf of the gas industry, the National Gas Council, through the President (Mr. D. Milne Watson), made a strong protest to the then Government against

the suggested subsidies; and it was urged that if these were allowed, then like consideration should be granted to the gas industry. The national work of the gas industry in connection with the economical utilization of coal was pointed out. But since then Mr. Ramsay Macdonald and the other Labour-Socialist Ministers who were attempting to make political capital at the taxpayers' expense have been thrown from the seats of the mighty, and are now impotent in this matter. But the National Gas Council, not willing to take risks, have sent their protest also to the new Premier, the Chancellor of the Exchequer, and the President of the Board of Trade. We imagine that their view will be that it is better to let the evolution of each industry proceed naturally, without indulging in speculative schemes such as their predecessors favoured. These are not what industry wants. Their interests, which are those of the country, will be best served by lightening the burden of taxation; but the Labour-Socialist Government proposed to assist in maintaining that burden by preferential help to a single industry. It will not do.

**An Ideal Town at Wembley.**

It is a bit early to say what (if anything) will be done by the electricity industry next year at Wembley. But there have been writings in the electrical papers advising the industry not to put in an appearance in co-operative state, but to follow up locally the work done at the exhibition this year, and to reserve funds and energies for a big splash of their own later on. That is the direction in which the wind was blowing recently; in fact, at a meeting a short time since of the Manufacturers' Organization — the "B.E.A.M.A." — practical unanimity was shown against exhibiting next year. Now "The Times" states that the industry "is considering what steps shall be taken next year, and considerations are chiefly concerned with questions of time and terms. There is a strong feeling throughout the industry that every effort should be made to secure adequate representation; but at the same time it is felt that the exhibit next year should be wholly different from that which has just been seen." That statement is altogether opposed to prior impressions—in fact, there has been strong advocacy of the industry being represented at the Ideal Home Exhibition, and not at Wembley. Then, we see, Lord Stevenson is hopeful of electrical co-operation in connection with an "Ideal Town" at Wembley. In an interview with a representative of the "Evening Standard," he said:

> One of the new things we hope to have is an electric town. This would show just what the ideal town ought to be like, the latest ideas in town-planning being the basis of a scheme that would include electrical equipment of every kind. Here is a unique opportunity for the whole of the electrical industry to show to the world what wonderful advance can be made.

The suggestion of an ideal town is a very attractive one; but will it be sufficiently magnetic to induce the electricity industry to put up the money for its equipment? Turning from our morning and evening contemporaries to the "Electrical Times," "Meteor" says:

> It is now widely known that there is a very strong majority opinion against any further electrical exhibition before (say) 1927. And when the electrical industry next makes an effort of this kind, it is highly probable that the display will be one of electrical and allied interests exclusively; it is unlikely to form part of any general exhibition such as that held at Wembley this year.

What about the Ideal Home Exhibition? Between these different predictions and hopes, there is nothing definite; but the attitude of the electrical papers should certainly create an atmosphere of opposition to a display at the Wembley Exhibition next year.

**Petersfield Discontented.**

The good folk of Petersfield, or their local Council, a time ago thought they would like to have their streets illuminated by electricity instead of gas. They have had their way, and the result has not given satisfaction. This was palpable at the annual meeting of the Ratepayers' Association. The criticism of the electric lighting was to the effect that it was far from being as good as gas. Lamps of higher candle power, it was held, would have to be used; and who, it was asked, was going to foot the bill? Yet one speaker stated that the Electric Light Company were—philanthropic people!—actually giving "stronger" lights than were agreed upon. If that is so, then the Petersfield ratepayers would, we imagine, not have found with the lower-power lamps words adequate to express their feelings as to the lighting of their streets. There seems to be little doubt that the Council entered into a five years' contract with their eyes shut—anyway, they could not have given that consideration to the matter which is usual in business transactions. Before one enters into a contract, it is the common practice to ascertain what is being paid for, so as to ensure that value is received for money spent. If the lighting now is inferior to that which used to be obtained from gas, and yet the lamps are "stronger" than the ones bargained for, then the Council ought surely to be censured for committing the ratepayers to this sort of thing. It is a somewhat common experience, when there is a desire to change to electricity, to decry the illumination afforded by the gas-lamps, and to magnify what will be done by the electric lamps. To show economy, the electrical people have a habit of quoting for lamps of low consumption, from which credulous councillors think they will obtain the same illumination as from gas. Electric lamps give a concentrated light, and so the distribution is bad. This is especially the case with the gasfilled type of lamps with their short length rays. To obtain the same light distribution as from gas, higher candlepower electric lamps are required. But the higher candlepower lamps cost more money per annum. So it comes about that the ratepayers of Petersfield are to-day paying more money than before for an inferior article. Not even the supporters of the Electric Light Company deny this. But they plead that the Company are in their infancy; and if there is patience, they may improve matters. The Company may be in their infancy; but electric lighting is not. If the Company know their business, they can "improve" the lighting just as easily now as at a later time. For this, however, someone will have to pay; and who but the ratepayers? The Sub-Committee of the Ratepayers' Association have had the matter referred to them. The trouble, however, did not end there. A letter was read from a ratepayer, stating that some of the electric light standards and poles had actually been placed in the middle of the kerb, and that they should be painted, as it was impossible to see them on a dark night! That is bad. It suggests that even with the electric light, it is impossible to see the posts. There was also protest against the unsightliness of the posts, and against the overhead wires crossing gardens and disfiguring the whole town. Petersfield appears to be very unhappy over its electric lighting. Any small town thinking of converting its street lighting should apply to the ratepayers of Petersfield for a character as to efficiency. They may then prefer to continue the better agent.

**A Subway Fire.**

There was an uncomfortable experience in the subway running under Shaftesbury Avenue the other day. Just before noon dense clouds of smoke arose from openings in the roadway. What happened was that a main electric cable had caught fire; and firemen had to descend into the subway to extinguish the outbreak. In establishments in Soho where the electric light is used, candles had to be engaged to take its place.

**Belgian Parliament in Darkness.**

As has frequently been said, electricity is no respecter of persons. It fails the user at the most inopportune times; and it treats all alike without discrimination. Last Tuesday the fusing of the electric light wires put a sudden end to the sitting of the Belgian Parliament; both Senate and Chamber being plunged into darkness. The Houses were adjourned; and it was with the greatest difficulty that the members found their way to the doors. Pending repairs to the lighting system, candles were brought into use for lighting the corridors.

## Paraffin Seals for Purifiers.

Annoyance experienced, particularly in some of the smaller works, from frequent blowing out of the water in the seals of purifier boxes, has led Mr. F. H. Shelton to describe a "wrinkle," which is reproduced in the "American Gas Journal," for overcoming the difficulty pending a permanent cure by the provision of larger boxes. The suggestion is to employ paraffin wax, which when cold is hard, but at a temperature of 110° becomes liquid. Thus, if this be substituted for the usual water in purifier seals, when in its normal cold condition it will hold the purifier cover so firmly in place that no gas pressure short of an explosion can lift it; while if it be warmed into a liquid condition, the cover may be lifted as readily as if the seals contained water. Steam heat is sufficient for the melting, and all that is needed is to place the pipe containing the steam so that the heat will be quickly transmitted to the wax. As radiating surface is what is required, good-sized pipe should be employed (say, 1¼ in.), but the connecting pipe may be somewhat smaller. Mr. Shelton shows the pipe so placed that the cover of the box rests directly on the top of it, but, of course, if found desirable, means may be provided for taking the weight off the pipe. The steam pipe connection may be made in several ways, and two of these are illustrated.

**The Trent Process.**—Messrs. Catlin & Pope, of New York City, are offering 65,000 $27.50 shares in the Superfuel Corporation of New York. "Superfuel" is a combustible produced from anthracite screenings and sweepings by the Trent process, which, briefly stated, consists in pulverizing the screenings, and passing the powder through an agitator containing oil and water. The oil causes the coal particles to coalesce, while the inert material is unaffected. Consequently the process is a de-ashing one; and it is stated that as much as 60 p.ct. of the ash in the original sweepings is eliminated. The coal-oil amalgam is pressed into briquettes by being passed through an extruding machine. From this it is ejected through circular orifices; the material thus forced-out being cut to the required length. These pieces are then heated in a retort at a temperature commencing at 200° and ending at 1000° Fahr. Briquettes made in this manner, it is said, are hard and waterproof, make a hot glowing fire, and do not crumble or change shape until they are entirely consumed.

# NATIONAL GAS COUNCIL.

### Central Executive Board.

The Central Executive Board of the National Gas Council met on Tuesday, the 9th inst., at No. 28, Grosvenor Gardens, S.W. In the absence of Mr. D. Milne Watson, the chair was taken by Alderman F. S. PHILLIPS, J.P. (Vice-Chairman).

MAINS AND SERVICE PIPES IN HIGHWAYS: RIGHT TO BREAK-UP ROADS.

It will be remembered that the London County Council passed a resolution some months ago to the following effect: "That the grant to private statutory companies of the right to use public streets without charge for the purpose of laying-down pipes or wires ought not to involve obligation upon local authorities to keep such streets unaltered for ever, or, if they be altered, to bear the cost of any necessary removal and relaying of pipes or wires." The London County Council had circulated the foregoing proposition to the County Councils' Association, the Rural District Councils' Association, the Urban District Councils' Association, and the Association of Municipal Corporations.

A Joint Conference of public utility undertakings concerned was held in February last, when it was decided to lodge a joint protest against the resolution of the London County Council, and, in particular, against the statement that statutory companies had the right to use the public streets "without charge," and to forward a copy of their objection to the Metropolitan Boroughs Standing Joint Committee, the County Councils' Association, the Association of Municipal Corporations, the Urban District Councils' Association, and the Rural District Councils' Association. It was also decided that, should legislation be introduced with a view to altering the present law, public utility undertakings should take joint action to oppose the same. It was agreed that a communication should be sent to Sir Henry Maybury at the Ministry of Transport, urging him to expedite a conference with the County Councils' Association, and asking that the Associations representing other sub-surface users of the roads should be invited to nominate representatives to such conference.

The County Councils' Association have now put forward proposals which are, in effect, that the existing law which granted to statutory undertakings the right to use public streets for the purpose of laying-down pipes or wires should be entirely reversed, so that, instead of there being a certain amount of discretion in the hands of the undertakers with regard to the laying of such pipes or wires, in future the discretion would be absolutely in the hands of the highway authorities. The County Councils' Association indicated that the time had now arrived for a comprehensive inquiry into the question, either by a Royal Commission or a Departmental Committee.

A further conference of the Council and public utility undertakers was held on Nov. 12, when it was decided that representatives of gas, water, and electricity interests should meet the County Councils' Association in conference on this matter.

ATTITUDE OF THE COUNTY COUNCILS.

Communications have recently been received by gas undertakings from roads departments of county councils enclosing a form of application which the gas undertaking is to make to the highways department for "permission" to break-up roads and reinstate trenches. Permission was apparently only to be granted on the undertaking agreeing to certain conditions as to liability, depth of pipes, use of steam roller, &c. One county council were endeavouring to charge a fee of a guinea in respect of every such application. It was stated that the Council had advised undertakings receiving such applications to refuse absolutely to comply with them, as the same were *ultra vires*.

MAINS OF INSUFFICIENT CAPACITY.—ORDERS UNDER SECTION 10 OF THE GAS REGULATION ACT.

It was reported that the draft clause relating to relief from the obligation to supply gas where the mains were of insufficient capacity had now been agreed by the officers of the Council, the Parliamentary Agents, and the Gas Company (in connection with whose Draft Order under section 10 this clause had been contested before a Select Committee of the House of Commons), and had been forwarded to the railway companies for their approval about the middle of November. Nothing had as yet, however, been heard from the railway companies, but it was expected that before Parliament met again in the spring a clause would have been agreed.

TAR VERSUS BITUMEN FOR ROAD SURFACES.

Great disappointment was expressed at the continued delay in publication of the report of the laboratory and field experiments carried out by the Joint Committee of the Ministry of Agriculture and Fisheries and the Ministry of Transport, as to the effects on fish and stream life of washings from bituminous surfaces.

METROPOLITAN WATER BOARD REGULATIONS AS TO HOT WATER APPARATUS.

It was reported that, in view of the fact that the Metropolitan Water Board persisted in their attitude of definitely refusing to allow a geyser to be fixed to a main, the Council, in consultation with their Solicitor, had prepared a request to the Metropolitan Water Board to amend their regulations. This document had been signed by ten users of water in the area of the gas undertakings affected, and had been served on the Metropolitan Water Board.

JUDGMENT OF THE LATE MR. JUSTICE BAILHACHE IN THE CASE OF LAPISH VERSUS BRAITHWAITE.

It was reported that the decision of the Court of Appeal reversing the decision of the late Mr. Justice Bailhache in the above case was to be taken to the House of Lords.

CENSUS OF PRODUCTION.

It was reported that a Census of Production was to be taken by the Board of Trade for the year 1924; and the question had arisen as to the form in which the gas industry should be asked to supply the information required. It was understood that the Board of Trade were revising their original draft form of inquiry, and this matter would therefore come up for further discussion at the next meeting of the Board.

# INSTITUTION OF GAS ENGINEERS.

### New Members and Associate Members.

The following new members and associate members were on the 8th inst. elected to the Institution of Gas Engineers.

MEMBERS.

Banks, Harry, Assistant Engineer and Manager, Gas-Works, Northampton.
Borresen, Johs E., Director of the Copenhagen Gas and Electricity Works, Copenhagen.
Buckley, Fred. Henry, Manager, Gas-Works, Formby, Lancs.
Cook, Thomas Rowell, Deputy Engineer, Gas-Works, Southport.
Dickson, James, Engineer and Manager, Gas-Works, Kirkintilloch.
Holt, Charles Edward, Engineer and Manager, Gas-Works, Wilmslow.
Hood, John (Institution's 1st Class Diplomé in Gas Engineering), Chief Technical Assistant, Gas-Works, Shrewsbury.
Hughes, Henry, Engineer, Gas-Works, Melksham, Wilts.
King, A. Gordon, Service Engineer to the American Gas Association, No. 342, Madison Avenue, New York.
Logsdon, Stanley Ernest, Gas Engineer, Pernambuco Tramways and Power Company, Pernambuco, Brazil.
Merrell, John Joseph, Gas and Water Engineer, Sutton-in-Ashfield.
Muller, Walter, Chief Engineer, Santiago Gas Company, Santiago, Chile.
Perry, Samuel Thomas Percy, Station Engineer, Gas-Works, Brentford.
Robinson, Harold, Manager, Gas-Works, Annan.
Smith, Thomas Webster, Engineer, Manager, and Secretary, Whitworth Vale Gas Company.
Stevenson, Ernest Percy, Chief Engineer and Acting General Manager, Primitiva Gas Company, Primitiva, Buenos Aires.
Sutton, John Edwin, Engineer and Manager, Gas-Works, Ramsbottom.
Sturrock, Robert, Engineer and Manager, Gas-Works, Ardrossan.
Vardy, William Andrew Shakespeare, Gas Manager and Analyst, Whitwood Collieries, Normanton.
Willsmer, Norrie, Station Engineer (Harrow), Brentford Gas Company.

ASSOCIATE MEMBERS.

Adams, Leslie Mansfield, Senior Chemist, Southall Station of the Brentford Gas Company.
Bennett, Edward William, M.C., Assistant Engineer (Brentford), Brentford Gas Company.
Chester, Cecil Harry, Assistant Engineer and Manager, Gas-Works Wakefield.
Chisholm, William Wallace, General Assistant, East Hull Gas Company, East Hull.
Clare, Thomas Arnold, Chief Draughtsman, Brentford Gas Company.
Duncan, Clifford, Engineering Assistant, British Gas Light Company, Hull.
Grant, John Kenneth, Assistant Works Superintendent, South Suburban Gas Company, Sydenham.
Howard, Francis Walter, Technical Assistant, Vauxhall Works, South Metropolitan Gas Company, London, S.E.
Jack, Harold, Chief Chemist and Draughtsman, Gas-Works, Southport.
Kelham, Bernard, Technical Assistant to Mr. P. C. Holmes Hunt, M.Inst.C.E., M I.Gas E., Melbourne.
Langstreth, Gilbert, Assistant Gas Engineer, Corporation Gas Department, Burnley.
Pexton, Stuart, Ph.D., M.Sc., Research Gas Chemist, Gas Light and Coke Company, Horseferry Road, Westminster, S.W.
Prince, Raymond, Deputy Engineer and Manager, Gas-Works, Heywood.
Redwood, Harold Holmes, Works Assistant, Gas-Works, Dorking.
Shaw, Eric Baden, Works Manager, Gas-Works, Stoke on-Trent.
Smith, Sydney, Chief Chemist, Corporation Gas Department, Birkenhead.
White, Francis, Engineering Assistant, South Metropolitan Gas Company, Old Kent Road, London, S.E.
Willis, Edward Rowland, Assistant in Carbonizing Department, Southall Station, Brentford Gas Company.
Wright, Gareth Allan, Assistant Superintendent, Avon Street Works, Bristol Gas Company.

## CITY AND GUILDS OF LONDON INSTITUTE.

**Report on the Work of the Session, 1923-24.**

The report on the work of the Department of Technology of the City and Guilds of London Institute during the session 1923-24 (published by John Murray, of Albemarle Street, W., at the price of 1s. net) shows that the entries of candidates for examination in technical subjects were very much the same as in the preceding session, except for the fact that in England and Wales in the session under review no examinations were held in either Grade I. of Gas Engineering or Grade I. of Gas Supply. The candidates for these examinations at other centres numbered 27, which compares with a total of 365 in Great Britain and Ireland for the same grades in the session 1922-23. The consequent difference of 338 more than accounts for the decrease from 7232 to 6924 in the entire number of candidates examined in England and Wales. For Great Britain and Ireland as a whole, the total number of candidates fell from 8707 to 8578.

In explanation of the reference in the above paragraph to the absence of certain examinations in the past year, it is pointed out that, examinations for those studying on professional lines having been established by the Institution of Gas Engineers in conjunction with the Board of Education, no application was made for the holding in 1924 of the Institute's examinations in Grade I. of Gas Engineering and Gas Supply in England and Wales. For the purpose of considering in what way the Institute's examinations for candidates not definitely on the professional plane could in future best be co-ordinated with the Examinations of the Institution of Gas Engineers, a meeting was held at the offices of the Institution, which the Chairman of the Technology Committee and the Superintendent of the Department attended. It was decided to alter the titles of the Institute's syllabuses to Gas-Works Practice and Gas Supply Practice. A thorough revision of these syllabuses (after a Sub-Committee appointed for the purpose have reported further on the matter) is promised for the programme of the 1925-26 examinations, which will make its appearance in due course. Some modifications of the syllabuses have been made in the programme for the session 1924-25, which was referred to in the "JOURNAL" for Sept. 17 last (p. 873). In this programme, it may be mentioned, a change has also been made by the removal of all lists of text-books and works of reference to an appendix, and the opportunity has been taken to insert in all except a few cases the latest edition and price of the several books mentioned.

From the customary tables in the report can be ascertained the general results of the examinations, with details of passes and failures; and these show the percentages of failures to have been as follows: Coke and Bye-Products Manufacture, 16·6; Coal-Tar Distillation, 16·6; Dyes and Colouring Matters, 23·1; Gas Engineering, 35·1; Gas Supply, 50·5; Gasfitting, Grade II., 36·7; Gasfitting, Final, 21. The number of candidates presenting themselves was: Coke and Bye-Products Manufacture, 24; Coal Tar Distillation, 18; Dyes and Colouring Matters, 13; Gas Engineering, 165; Gas Supply, 196; Gasfitting, Grade II., 79; Gasfitting, Final, 19. The Acting Examiners were: Gas Engineering, Mr. S. Tagg; Gas Supply, Mr. H. Kendrick; Gasfitting, Mr. R. J. Rogers; Coke and Bye-Products Manufacture, Mr. C. P. Finn; Coal Tar Distillation, Mr. W. H. Coleman; and Dyes and Colouring Matters, Prof. G. T. Morgan, F.R.S.

## SULPHUR IN COKE.

In Vol. XLV., No. 1, of the Journal of the American Chemical Society, Alfred R. Powell gives his researches on the forms of sulphur in coke; and the following is a summary of his conclusions.

(1) A phase-rule study of the system involving the carbon-sulphur complex existing with carbon at high temperatures has brought out the fact that this sulphur occurs in two forms: (*a*) Adsorbed free sulphur, and (*b*) sulphur in solid solution in the carbon or held on the surface of the carbon in such a manner that it is impossible by any known means to differentiate it from a solid solution.

(2) Coke made in the laboratory by rapidly heating coal contains sulphur in three forms: (*a*) Adsorbed free sulphur, (*b*) sulphur in solid solution in the carbonaceous mass, or held on the surface in such a form as to exhibit all the properties of a solution, and (*c*) ferrous sulphide together with much smaller quantities of calcium and magnesium sulphides. When this coke is kept at a red heat for several hours, the adsorbed sulphur slowly passes into solid solution.

(3) Coke made by the usual commercial process of carbonization over a comparatively long period contains, before it is cooled, but two forms: (*a*) Sulphur in solid solution or held on the surface in such a manner as to resemble a solid solution in all of its properties, and (*b*) ferrous sulphide with smaller quantities of other metallic sulphides; the adsorbed sulphur mentioned above being missing or present in inappreciable quantities.

(4) When coke cools, even with limited access to the air, oxidation of ferrous sulphide occurs. This is due to the reaction $4FeS + 3O_2 = 2Fe_2O_3 + 4S$.

When the coke is quenched, as in ordinary coke manufacture, this decomposition of ferrous sulphide is not complete, due to the speed with which the temperature of the coke is carried below that for effective oxidation. However, coke held at a temperature in the neighbourhood of 500° C., even with limited access of air, shows almost complete oxidation of the ferrous sulphide.

(5) When hydrogen, or hydrogen-containing gas, is passed through red-hot coke in a coking chamber, the sulphur removed as hydrogen sulphide comes from the decomposition of ferrous sulphide, because this compound has the highest dissociation pressure of any sulphur form in the coke.

## VERTICALS FOR SMALL GAS-WORKS.

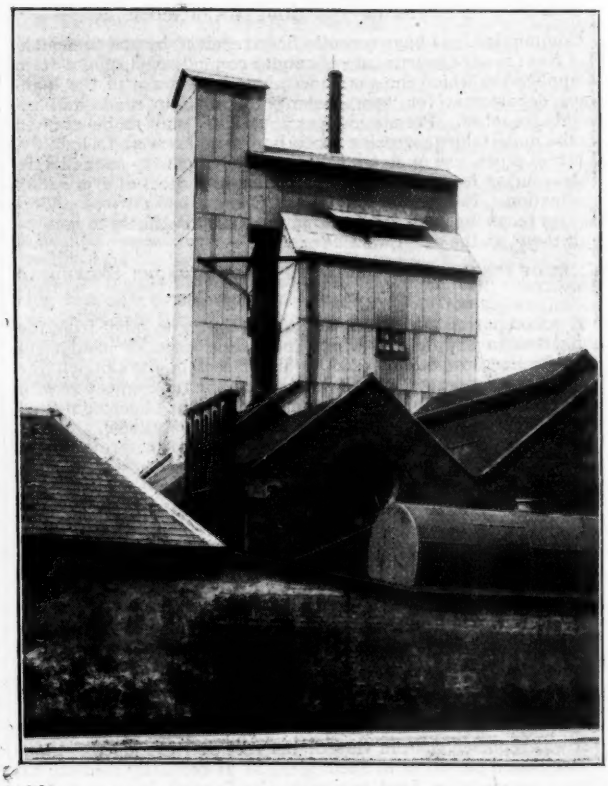
It is generally supposed that, whereas continuous-working vertical retorts have shown a marked advantage over all other systems for gas production in large works, they are not suitable where small gas outputs are required. In recent months this has definitely been shown not to be the case, as from many points of view continuous verticals have a big advantage over other carbonizing systems for even the smallest works.

The gas engineer of a small works is more dependent on reliability of plant, ease of control, constancy of conditions, and labour-saving devices than those engineers who have facilities in the form of technical staff and mechanical appliances which are not available in small undertakings. It must also be remembered that the engineer of a small works has duties and responsibilities of a much more varied nature than are called for from engineers individually in larger undertakings. Any carbonizing system, therefore, that is to be successful on a small works must fit into the requirements of a small works and improve on conditions which previously held.

Gas engineers are gradually being converted to the advantages of continuous verticals for small works; but even at the present time the majority of engineers are of the opinion that the system is not applicable to works of a carbonizing capacity of less than six tons per day. This is definitely not the case, as is illustrated so markedly by the installation of Woodall-Duckham continuous vertical retorts at Innerleithen.

The installation has a nominal carbonizing capacity of six tons per day, and consists of two retorts, each of which can be worked independently. The retorts are rectangular in cross section, 25 ft. long, and measure 3 ft. 11⅜ in. long by 8 in. wide at the top, and 4 ft. 2¼ in. long by 19½ in. wide at the bottom. The retorts are heated by means of two producers, one of which may act as a standby; and they have sufficient capacity to heat the present plant, and a contemplated extension of two further retorts.

The plant has been working something like 33 weeks; and although horizontal retorts had previously been used, the new system is giving every satisfaction to the Gas Company, and the

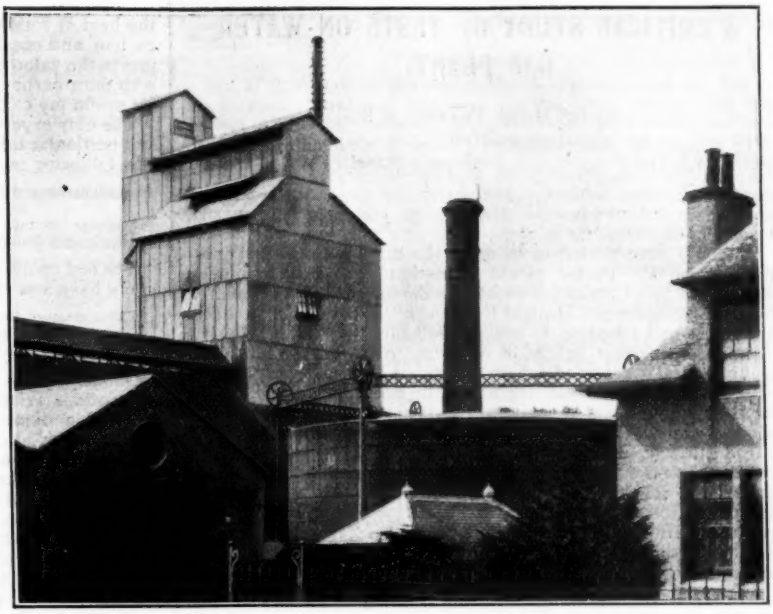


Innerleithen—Woodall-Duckham Retort House.

horizontals have been shut down. Mr. J. Shiell, the Engineer, is to be congratulated on the way in which he has been able to change his perspective from horizontal practice to that of continuous verticals. To a gas engineer on a small works, the problem might easily appear to be insuperable. Mr. Shiell is now an enthusiastic advocate of vertical retorts for small works.

For many weeks his requirements for gas have been no more than required the working of one retort with a through-put of 3½ tons a day. It can safely be said that this is the only vertical retort plant which is continuously working on such a small carbonizing capacity. From April to December, the gas-works have averaged 16,900 c.ft. to the ton; the coal carbonized being 718 tons, and the total gas output for that period over 12,000,000 c.ft. This shows a definite saving of 234 tons of coal in 32 weeks, while at the same time there has been an increase in the make of gas of 2,122,000 c.ft.

With regard to labour, it is estimated that the annual saving in wages is approximately £180. In the first instance, three stokers—one each shift of eight hours—were employed; but at the present time it is only found necessary to have two stokers, each of whom works ten hours a day for six days a week. The lorry driver works five days on coal and coke, and on Saturday and Sunday works ten hours to provide the change-over shifts. Thus there are needed only three men on the works, each working sixty hours per week.



Another Aspect of the Retort House.

At the Discharge End.

The producers are on the ground, and are fed every four hours, and pricked and ashed-out every 24 hours. No trouble whatever is experienced in cleaning them. The heats are easily maintained, and require no special adjustments from time to time to make up for inadequate control.

During the last month the make on the one retort has varied between 65,000 and 68,000 c.ft. per day, and the coal carbonized has averaged 3½ tons—showing a make per ton varying between 18,580 and 19,400 c.ft. The second retort may be worked slowly during its intermittent use demanded by the requirements of gas stocks. The calorific value of the gas is determined by means of a "Sigma" recorder, and may be taken as averaging 475 B.Th.U. gross over the period in question.

For a small gas-works to be able to make over 80 therms to the ton during an extended period is indeed remarkable, and compares well with large installations and with other systems, in view of the adverse conditions on small works. There are many Woodall-Duckham installations of the largest type, and also of the smaller type, which are giving over 85 therms to the ton; and in special cases, where the local requirements demand it, and the calorific value will stand it, there is no difficulty in obtaining up to 100 therms to the ton.

## Lowering Large Gas-Mains.

In consequence of a change by the city authorities in the grade of two intersecting streets, for a distance of several hundred feet in all four directions from the point of intersection, in one of the districts of Philadelphia, it was found necessary to lower two large gas-mains under unusually difficult conditions; and the work, which has been completed successfully and without accident, is described in the pages of the "American Gas Journal" by Mr. H. B. Andersen, Assistant Engineer of Distribution to the Philadelphia Gas-Works. One main was a 48 in., and this was connected at the point of intersection with a 30-in. main extending both ways. In other words, there was a T, each arm of which was about 400 ft., and the trunk some 150 ft., long. All the ends were at the proper level, but from each of the ends towards the intersection the main needed gradual lowering, which reached its maximum of 12 ft. at the intersection. Various difficulties presented themselves. The 30-in. joints were of cement, and the main was supported on heavy concrete piers. While this main had to be lowered 12 ft. near the intersection, the 48-in. main at the same point had to go down only 2 ft. All were important feeders, and the larger main could not be shut down at all. The various conditions demanded, not only that the 30-in. mains should be lowered at the intersection to the level of the 48-in. main (so that the lowering of the two for the final 2 ft. could proceed together), but also that the duration of the shut-off be not more than eleven hours. A way was devised of cutting out a piece of the pipe, and between the two ends so created placing a temporary connection flexible enough to admit of a drop of 10 ft. For this purpose three 12-in. pipes about 20 ft. long were used; flexibility being obtained by the employment of spirally-wound metallic tubing. The knowledge gained on this half of the work enabled the second similar part to be undertaken (and completed in eleven hours) without the use of the flexible connections.

**A Glasgow Bread-Baking Oven.**—A representative of the "Glasgow Herald," writing in their issue for Dec. 1, describes the method of baking bread at the large bakery of Lang's Bread Company, Glasgow. "In baking bread," he says, "the industry has been revolutionized in recent years. In Lang's bakery there is a mammoth gas oven which has displaced a large array of old-fashioned Scotch ovens. In respect of capacity to bake a given number of loaves at one time, this travelling oven is perhaps the largest of its kind. In the old style, the Scotch oven had to be cleaned out periodically, and cleanliness was always an effort. With the new travelling ovens there is no danger of contamination. The large new oven at this bakery measures 94 ft. long. The loaves pass in at one end and move slowly towards the other, from which they emerge in about 1 hour 45 minutes. As the process is continuous, at the rate of 50 loaves a minute, the scale of daily output can be imagined."

# A CRITICAL STUDY OF TESTS ON WATER GAS PLANT.

By Dr. M. W. TRAVERS, F.R.S.

In a separate communication I have pointed out, in reply to Dr. Parker, that the question of thermochemical data has no direct connection with the subject of my paper on water-gas plants (see "JOURNAL" for Nov. 19, p. 510, Nov. 26, p. 580, Dec. 3, p. 663, Dec. 10, p. 731).

I should have preferred to defer the discussion of the questions which Dr. Parker raised in his letter till they had been considered by a Committee which, I understand, is to be appointed by the Institution of Chemical Engineers. But it will do no harm at least to call attention to certain difficulties which Dr. Parker dismisses somewhat lightly, in referring to certain constants as being generally accepted. I do not feel at all sure that either of us is entirely right or entirely wrong in adopting certain values for the constants which we use, so I will set down the conclusions which I arrived at after a very careful analysis of the literature of the subject; and perhaps Dr. Parker will do the same.

The thermal data which I have used in the paper on the water gas process referred to above are based upon the results of experimental researches, which I have assumed to be represented by the equations written below. The figures express the results in kilo-calories per kilogram-molecule, or in centigrade heat units per pound-molecule.

(*a*) $H_2O$ (steam) = $H_2O$ (water) + (10,725 − 10*t*° C.)
(*b*) $2H_2 + O_2 = 2H_2O + 2 \times 57{,}785$
(*c*) $2CO + O_2 = 2CO_2 + 2 \times 67{,}935$
(*d*) $C + O_2 = CO_2 + 94{,}750$

I will now explain why I have used these figures.

(*a*, *b*) The value of the latent heat of vaporization of water is taken from the pamphlet on thermal data issued by Holborn, Scheele, and Henning of the German National Physical Laboratory in Charlottenburg. Prof. W. A. Roth (*Zeit. Electrochimie*, 1920, *26*, 290) after reviewing all the available data relating to the heat of evaporation of water, arrived at the value 68,380 (gross). From these two sets of data we have for the net value 68,380 − 10,575 = 57,805 at 15° C. We can obtain the value of $Q_o$, the heat of formation (net) of water at 0° C., from the following data:

| | |
|---|---|
| Heat of reaction, 15° C. | 57,805 |
| Thermal capacity of steam, 15° to 0° C. | 126 |
| Heat of decomposition of water, 0° C. | $-Q_o$ |
| Thermal capacity of $H_2 + O_2$, 0° to 15° C. | − 148 |

Then—

$$57{,}805 + 126 - Q_o - 148 = 0,$$
$$Q_o = 57{,}783 \text{ (say) } 57{,}785.$$

This is the value given in the table above.

(*c*) For the heat of combustion of carbon monoxide we have to rely on the work of Julius Thomsen, the details of whose experiments are set down in his classical work "Thermochemische Untersuchen." The individual results are not very concordant, though the mean of the results obtained in the two series of experiments which he carried out shows a very close agreement. It is time that this very important constant was re-determined; and as it is not difficult to prepare pure carbon monoxide, and as the quantity burned in any experiment is easily determined by absorbing and weighing the carbon dioxide produced, the work should not present any very great difficulty. The result is, of course, independent of the form of carbon from which the gas is derived.

(*d*) Under this heading we come to the real crux of the matter; and we will first consider the data at our disposal.

If we neglect the differentiation of graphite into $\alpha$ and $\beta$ varieties, there are only two *definite* forms of carbon—graphite and diamond. Amorphous carbon is an indefinite mixture of the non-crystalline form with the graphitic form, into which, as I shall presently show, it appears to change very readily. There is no definite material, at least no material to which we can attach definite chemical and physical properties, to which we can give the name amorphous carbon.

Graphite and diamond are very definite in character, and nothing shows this more clearly than the work of Prof. W. A. Roth on the heat of combustion of graphite from different sources (*Zeit. Electrochimie*, 1915, *21*, 1). The following is a summary of his results:

| Natural Graphite. | | Artificial Graphite. | |
|---|---|---|---|
| Ceylon I. | 7853 | Acheson electric | 7852 |
| Alibert | 7854 | Blast furnace I. | 7857 |
| Bayer Wald | 7857 | ,, ,, II. | 7857 |
| | | Cast iron | 7859 |
| | | Manganese iron | 7858 |

The mean value of the above, in calories per gramme, is 7856, and the value of the molar heat of carbon is 94,270. It may be observed, in passing, that the value assigned to the molar heat of the carbon as diamond by Prof. Roth is 94,430.

Mixter has also determined the heat of combustion of graphite, obtaining values of 7836, 7848, and 7810 (Am.J.Sci., 1905, *19*, 434) which support the results obtained by Roth. He also determined the heat of combustion of acetylene carbon, a very pure form of carbon, and obtained, as the mean of a large number of experiments, the value 94,750. It is this value, the result of experiments with pure carbon of hydrocarbon origin, which I have adopted for use in my calculations.

The only experiments with pure amorphous carbon which are of any particular interest are those carried out with sugar carbon. The following results have been obtained:

| | |
|---|---|
| Milchsack and Roth (Z.Angew.Ch., 1914, *27*, 5) | 96,950 |
| do. | 96,850 |
| Mixter (loc.cit.) | 96,690 |
| Roth and Wallasch (Landolt and Bornstein) | 96,720 |

The last result is probably the most reliable (Roth).

We have now the following data to consider:

| | |
|---|---|
| The mean of Roth's experiments on graphite | 94,270 |
| Mixter's value for acetylene carbon | 94,750 |
| Roth and Wallasch's result for sugar charcoal | 96,720 |

One is perhaps inclined to select the latter figure as a basis for calculations relating to water gas production, particularly as the mean of a number of experiments on gas carbon and similar material yielded (Roth) the value 96,240. Calorimetric determinations point to a much lower value; we have, however, certain other facts to take into consideration.

The results of investigations on the conditions of equilibrium between gases and carbon show, when amorphous carbon is used, a discontinuity at temperatures about 1000° C. This is to be expected, for amorphous carbon is an unstable substance, and will tend to pass into the stable or graphitic form, with loss of energy, the more rapidly as the temperature rises. As examples of this I will refer to the well-known experiments of Rhead and Wheeler on the $CO_2$ — CO — C equilibrium (Chem.Soc.J., 1910, 1911), and to the more recent experiment on the $CH_4$ — $H_2$ — C equilibrium. It is clear that, in these experiments, as soon as a temperature of 1000° C. was reached, at least the surface layers of the carbon became changed into the stable, or graphitic, variety.

All the work which I can call to mind involving the action of gases on coke relates to action of steam upon carbon; and there does not appear to be any evidence of the kind of change to which I have referred. Generally it seems to me unlikely that the carbon in coke should remain in the unstable form when subjected to the action of reacting gases and in contact with mineral matter (ash) which would have a powerful influence in catalyzing the change

Amorphous carbon → Graphitic carbon.

The apparent metastability of sugar charcoal is possibly associated with the fact that it is practically ash-free.

In considering processes such as the water gas process, supposing that amorphous carbon is used, one has really to consider the change indicated above as superimposed upon the reactions which give rise to water gas and blow gas. One may then write for the three main reactions—

C (graph.) + $O_2$ = $CO_2$ + 94,270
C (graph.) + $H_2O$ = CO + $H_2$ − 31,450
C (amorph.) = C (graph.) + *h*.

*h* has a maximum value in the neighbourhood of 96,800 − 94,270 = 2350; but as it represents a change taking place in an unstable system, the rate of change in which is quite independent of either reaction, and certainly increases with rise of temperature, it is more than probable that a share of the free energy, corresponding to a quantity of carbon greater than that consumed, would be set free during the blow, when the temperature attains a maximum, and that a corresponding lesser quantity would be set free during the run. This is another way of putting forward the idea, which appears to me to be thermodynamically sound, that the energy liberated during the blow might correspond to a value for the heat of combustion of carbon higher than that deduced from calorimetric experiments, and that the energy absorbed during the run would then correspond to a heat of reaction lower than that deduced from the same observation. That is, owing to the instability of amorphous carbon, the water gas process would be slightly more efficient than first considerations would lead us to expect. This condition only applies to amorphous carbon, which is, of course, a mildly explosive substance. (No need for alarm.)

But how are we to class coke carbon? I see no reason for adopting the common assumption that the heat of combustion of coke carbon to $CO_2$ is identical with that of pure amorphous carbon. The physical properties of coke, at least of well-burned coke, appear to resemble those of graphite more closely than those of the latter substance. Though I cannot show that the question is definitely settled by any unimpeachable series of experiments, designed to solve the problem which we are discussing, there seems to be an accumulation of evidence in support of the idea that the heat of combustion of coke carbon is not higher than 95,000. The mean result of 26 calorimetric determinations of the calorific value of coke, published by the Fuel Research Board, corrected for hydrogen and sulphur content, gives the value 95,100, which is probably subject to a further correction for reduced iron compounds. It is really about time that such fundamental physical constants were properly investigated.

Possibly the figure which I have been using is on the low side. However, if I am wrong in adopting 94,760 for the heat of (total) combustion of coke carbon to $CO_2$, it follows that the water gas process may be even more complex than it has been assumed to be. The complication diminishes in importance with the quantity "*h*," which defines the proportions of amorphous and graphitic carbon in the material.

## INDUSTRIAL SALESMEN'S CIRCLE.

The Inaugural Meeting of a valuable development of the British Commercial Gas Association's scheme of Salesmen's Circles was held at No. 28, Grosvenor Gardens, London, S.W., on the afternoon of Monday, Dec. 1, when Mr. F. W. GOODENOUGH presided over a representative gathering of salesmen, drawn from various parts of the country, particularly interested in the applications of gaseous fuel for industry and factory service.

The CHAIRMAN said the idea of the Circle was to stimulate interest in problems that had been successfully overcome, and also, particularly, in preventing waste of time involved by the representatives of one undertaking thinking-out and experimenting on matters which had already been dealt with by some other undertaking. The problems with which the industrial salesman was faced were varied and specialized, and could not be adequately discussed at ordinary meetings of the District Salesmen's Circles, where many problems of the domestic and commercial world and of general salesmanship had to be considered. He thought these meetings of industrial salesmen would be excellent from the point of view of pooling experience and interchanging the solutions of problems. It was proposed to hold a meeting of the Circle once a quarter, or more frequently if found desirable, in convenient centres throughout the country. The Chairman expressed the hope that various undertakings would offer facilities in this direction, and also provide opportunities for delegates to inspect installations on the district, as well as the indoor organization of the gas undertaking for dealing with industrial propositions. The inspection of experimental shops, demonstration showrooms, &c., would be valuable and instructive.

At some future meeting in London it was hoped to arrange for the delegates to visit the Gas Light and Coke Company's experimental shops at Goswell Road, as well as one or two particularly interesting jobs which had been, or were being, carried out in factories where special apparatus had been evolved and installed. No doubt it would be possible to arrange similar facilities in other towns.

### PERIODICAL INSPECTION OF FACTORIES.

The CHAIRMAN briefly sketched the system that the Gas Light and Coke Company had been following for some time past for the periodical systematic examination of every factory in the district, the results of which had certainly justified the time and money spent. An "obtaining entrance" letter was sent, informing the proprietor that a representative would be calling with a view to seeing that the gas apparatus in use was giving the best possible service, and to offer any advice that might be useful with regard to the further employment of gas in the factory. By this means they had been able to substitute efficient for obsolete gas apparatus, and had carried out all sorts of experimental work for factories, thereby securing a large number of important installations and maintenance contracts, as well as the goodwill of the manufacturers.

Mr. H. H. CREASEY, who has charge of this special section, on the invitation of the Chairman told of the development of the scheme. It was started in a very small way (only one representative being allocated to deal specially with factories), with the idea of making periodical examinations of all factories in the area of supply. The staff had been considerably augmented, and now eleven men were regularly employed on this special work. Something like 6000 factories—out of about 10,000—had been already tackled, and the resultant business was remarkable. He emphasized the necessity for choosing the right man for this work. He should be a responsible employee with practical knowledge of the subject; one who had been in touch with customers, and who had an aptitude for the class of work. Before visiting a factory, the representative was given a form containing a list of the processes in which heat played a part in the trade carried on at the factory in question, and he checked off on this list the purposes for which gas actually was issued. The information obtained was noted on the records. At the same time as he was making his examination, he tried for new business. It was found that in by far the greater proportion of industrial problems special apparatus to meet individual manufacturers' requirements had to be designed.

Mr. Creasey mentioned several satisfactory installations that had been specially designed and put into operation, as typical of many others which were proving a source of profit to his Company.

### SPECIAL APPLIANCES FOR PARTICULAR PROCESSES.

Mr. B. W. BROOKS, who has charge of the Gas Light and Coke Company's Industrial Experimental Shops, and is the Company's expert advisor on trade and factory problems from the fuel point of view, stated that during the past twelve years his Company had either actually made or fitted to consumers' own appliances no less than 1722 different types of burners. It was found that, by studying consumers' requirements, special appliances for each particular process procured the best results. With regard to the point raised by the Chairman as to publishing particulars and photographs of interesting installations at manufacturers' works, he said it was his experience that many manufacturers raised objections to this, but drawings, &c., could be available for the use of the Circle.

Mr. Brooks, in the course of his remarks, mentioned cases concerning the use of gas in the forging of heavy chains, in processes connected with wireless, and in tubular heaters for immersion in liquids.

### Discussion.

Mr. A. B. ROXBURGH (Newcastle) stated that trade was very bad in his district. Newcastle had very few factories. Before the war Messrs. Armstrong Whitworth employed 23,000 workpeople, and now only 5000. There was not much room for development in this direction. The price of gas had increased, and this also seriously affected business. Local disability prevented attractive discounts being allowed by his Company. He expressed the opinion that there should be a new type of charge for industrial purposes, and that each piece of industrial gas apparatus should be inspected at least once in every six months. The question of the insulation of furnaces was very important, and he hoped this would be dealt with at subsequent meetings. He strongly confirmed the point that practically all important installations had to be treated individually; but he thought there was also plenty of room for standard types of furnaces.

Mr. E. L. OUGHTON (South Suburban Gas Company) remarked that his Company had not done a great deal on the industrial side. His Board had sanctioned a scheme for inspection of industrial appliances; and when the stress of business in other directions was lessened, this would be undertaken. It was surprising, even in a non-industrial town, how many small industries there were in which gas could be used—such as laundries, bakeries, &c.

Mr. A. J. GARWARD (Portsmouth) stated that his town had a few small factories, and the Gas Company had been able to adapt a fair number of machines to be heated by gas, with exceptionally good results. He felt that there was need for periodical inspection of appliances used in factories.

Mr. B. J. BELL (Cardiff) pointed out that his Company's area of supply embraced the coal and shipping industries particularly. They had running at the recent Engineering Exhibition at Cardiff a number of industrial furnaces, and were training a man to deal with the industries existing in their area. The question of price hinged on output.

Mr. W. A. BISHOP (Croydon) remarked that his Company, in creating a demand for gas for industrial purposes, had found the publication "A Thousand-and-One Uses for Gas" of invaluable help. It was his opinion that distribution of this literature was infinitely better, and productive of bigger results, than the sending-out of letters. He referred particularly to the value of the recent "Printers'" number.

Mr. E. HARDIKER (Smethwick) said it was his experience that there was a great dearth of men who could go into works and factories and talk to engineers and other officials regarding the use of gas for industrial purposes, and he suggested that the "B.C.G.A." might consider the appointment of a representative who could visit undertakings for short periods and perform any special advisory work required. Many gas undertakings—especially small ones—could not afford to employ a man all the year round for the purpose of inspecting factories and giving expert advice. He had been asked by his colleagues in the Midlands strongly to urge the "B.C.G.A." to consider this matter.

Mr. E. A. LEASK (Leeds) stated that Mr C. S. Shapley (Engineer and Manager of the Leeds Gas Department) had given him authority to say he would support the Circle to the greatest possible extent.

Various other representatives contributed information of value on the subject, giving, in several instances, particulars of the successful application of gas in factory and trade processes. Useful information was furnished on heat-resisting bricks and the adequate insulation of furnaces.

The CHAIRMAN said it would undoubtedly be advantageous, and he hoped it might be possible, to arrange that, by co-operation with some of the leading undertakings, industrial experts should be available on the lines indicated by Mr. Hardiker. He added that he hoped the Industrial Salesmen's meetings would provide valuable material for "A Thousand-and-One Uses for Gas," or, if of a confidential nature, for the "Bulletin," and thereby prove of practical service to the whole industry. At future meetings it was proposed to have working drawings and plans of installations and apparatus for the perusal of members, and anyone in possession of information which would be interesting might come prepared with full particulars for discussion at the meetings. Likely subjects in connection with trade processes might also be suggested on which representatives would like information. If this was done, details of great value to all concerned might be forthcoming. Mr. Goodenough emphasized the importance of not forgetting that gas undertakings had coke to sell, and that, where solid fuel was most suitable, coke was the fuel that should be used. There was a big field for coke in place of coal where it was not possible to use gas. He concluded by saying that it was impossible to form any conception of the magnitude of the field for gas in industrial processes. There had been great developments in the use of gas for this purpose in America, and the "American Gas Journal" were publishing an interesting series of articles on the subject. These would, no doubt, be published in book form in due course, and he trusted would be available on this side; but if such was not the case, he hoped to secure complete sets of the articles for sale to representatives.

All present were unanimous as to the value of the first meeting of the new Circle, as well as to the possibilities for usefulness in this latest development. It was resolved that quarterly meetings of the Circle be held in various parts of the country, and that, if Mr. Shapley could make the necessary arrangements, the next meeting should take place in Leeds on Monday, March 2, 1925.

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**Recent Wills.**—Sir Albert Edward Bowen, who was Chairman of the Primitiva Gas Company of Buenos Ayres, as well as being connected with other South American Companies, left estate of the gross value of £641,440, with net personalty £575,470. The late Mr. John Murphy, for many years Chairman of the Alliance and Dublin Consumers' Gas Company, left estate valued at £156,040. The late Mr. Alfred T. Coates, who was Managing Director of the Whessoe Foundry and Engineering Company, Ltd., left estate of the gross value of £61,388, with net personalty £56,260.

## AMMONIUM SULPHATE AS A FERTILIZER.

In the "JOURNAL" for June 25, p. 906, were published a few extracts from a booklet entitled "Sulphate of Ammonia—Its Use in Agriculture," by Mr. T. H. J. Carrol, B.Sc., of the British Sulphate of Ammonia Federation, Ltd. No. 30, Grosvenor Gardens, S.W. 1. Mr. Carrol is now responsible for the publication of "Farm Notes"—a quarterly journal—the second number of which we have before us. The first number of "Farm Notes" was warmly welcomed; and it is interesting to note that requests for over 14,000 copies have been received for the second issue, which contains a good deal of information about sulphate of ammonia.

### MANURING OF HAY.

An article under the heading of "Does it Pay to Manure Hay?" gives an account of experiments carried out in Perthshire, Forfarshire, Aberdeenshire, and Sutherlandshire, on rotation hay. The general method of procedure was as follows: Algerian phosphate and kainit were applied to the young grass immediately the covering crop was removed. The following spring a standard dressing of ¾ cwt. of sulphate of ammonia per acre was applied. Taking the results of 1924 with those of 1923, an over-all profit of £1 per acre resulted from the application of sulphate. The quality of the hay was magnificent.

### WORTHLESS FERTILIZERS.

Farmers should be on their guard, it is stated, against paying extravagant prices for inferior manures. The following example shows how the analysis of a manure was quoted to mislead purchasers regarding its actual value.

| *Analysis as Stated by the Manufacturers.* | P.Ct. | *Analysis Correctly Stated,* | P.Ct. |
|---|---|---|---|
| Total phosphate . . . | 14 | Soluble Phosphate . . | 12 |
| Soluble ,, . . . | 12 | Insoluble ,, . . | 2 |
| Sulphate of Ammonia . | 7 | Nitrogen . . . . . | 1·5 |
| Potash Salts. . . . . | 10 | Potash . . . . . | 1·3 |
| | | (and possibly even less). | |

When in doubt farmers should write for advice to the British Sulphate of Ammonia Federation.

### DOES AMMONIA LAST TWO YEARS?

Another article contains evidence to show that the effect of a dressing of sulphate of ammonia is frequently extended to the succeeding crop. The reason for this, it is suggested, is that the sulphate becomes nitrified in the soil gradually and according to the nature of the season. Nitrogen is therefore constantly becoming available for the plant throughout the whole growing season. Should the growing period be unusually cold and wet, all the sulphate may not be used up. During the winter, nitrification generally ceases on account of the cold, and in consequence any ammonia which has not been nitrified and consumed by the crop during the preceding season lies dormant during the winter. With the advent of warmer weather in the following spring, nitrification recommences, and the ammonia becomes available for the succeeding crop.

### HOW TO VALUE FERTILIZERS.

The economic purchase of fertilizers is receiving greater attention by the farmer to-day than has been customary in the past. Too often has the farmer made the mistake of purchasing commodities of this nature which are the cheapest per ton, without looking into the fertilizing value. In manures the true fertilizing value depends on the percentage of potash, phosphate, or nitrogen which they possess, and on nothing else. It is therefore necessary for the farmer to understand the "unit price" method of valuation. The term "unit" means 1 p.ct. of nitrogen, phosphate, or potash per ton of fertilizer. The "unit value" or "unit price" is the cost of 1 p.ct. per ton, and is obtained by dividing the fertilizer price per ton by the percentage of nitrogen, phosphate, or potash which it contains. If sulphate of ammonia, which contains 21 p.ct. of nitrogen, costs £14 per ton, 1 p.ct. per ton costs 13s. 4d. Similarly, if nitrate of soda, which contains 15·5 p.ct. of nitrogen, costs £13 10s., the unit price of nitrate of soda is 17s. 5d. It can be seen therefore that, though the price of sulphate of ammonia may be 10s. per ton more than nitrate of soda, a farmer will, if he buys the latter, pay 17s. 5d. for the same amount of nitrogen as he can buy in sulphate of ammonia for 13s. 4d. Moreover, in a ton of sulphate of ammonia there are 470 lbs. of available nitrogen, against only 347 lbs. in nitrate of soda.

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**Society of Engineers.**—The President of the Society for 1925 is Mr. A. Stewart Buckle; and the Vice-Presidents, Messrs. G. O. Case, D. C. Fidler, and E. F. Spurrell.

**Masonic.**—A highly successful meeting of the Colne Valley Lodge, No. 1645, was held on the 9th inst., at Slaithwaite, Huddersfield, a very large attendance of visitors and members being present. Bro. R. H. Nuttall (late Gas Engineer at Marsden and Milnrow) was impressively installed W.M. for the next year. During the proceedings, W.Bro. Nuttall invested his J.W., Bro. Bannester, who for 42 years has been an active subscribing member of the Lodge. A somewhat unique feature mentioned by W.Bro. Nuttall was that the fathers of 66 p.ct. of the present members were either present or past members of the Lodge.

## YOUR EXCESS AIR.

By J. N. WILLIAMS.

There is an old adage that the onlooker sees most. While it would be presumptuous for an onlooker to adopt a dictatorial attitude, the following notes and conclusions may hold some interest for the gas industry.

During the past few weeks we have had occasions to visit several large gas-works having horizontal retorts in connection with the proposed installation of waste-heat boilers. In a number of cases the proposal has been discounted because, in the words of the engineer, "I have no waste heat available." The engineer obviously regarded this bald statement as signifying an efficient handling of the plant; whereas no great difficulties were encountered in showing that, in the light of recent developments, the works were not being run as economically as possible These developments have made it axiomatic that, if there is no waste heat which can be utilized, the settings are not operated efficiently. A fair average combustion-chamber temperature for horizontal settings would be 1000° C., with 14 to 15 p.ct. of $CO_2$ (equivalent to 50 p.ct. excess air). Allowing for an average degree of regeneration, side and main flue losses, the temperature, where available for a waste-heat boiler, should be in the region of 600° C., with 12 p.ct. of $CO_2$—equivalent to (say) 100 p.ct. excess air. Yet recently where we have found waste-heat temperatures of about 100° to 200° C., with a negligible $CO_2$ percentage, no efforts were being made to restrict the infiltration of air through faulty brickwork, dampers, draught regulators, &c.; and as a result thousands of pounds were being spent, simply to heat up wholly unnecessary excess air.

It may be argued that air infiltration is imperative to ensure the most favourable draught conditions. The reply to this is that the only satisfactory way of handling a waste-heat boiler proposition is to incorporate an induced draught equipment, when there is as complete, if not more complete, control over the draught. In the case of a large horizontal installation, it was recently pointed out that, though the main flues were black, a little more care in excluding excess air would result in the generation of all the steam for the gas-works free of charge, and the saving of many thousands of pounds per annum.

While on this question, it should be pointed out that water-tube boilers set in brickwork are much less suitable than fire-tube boilers for installation in connection with waste-heat recovery plants, on account of the probability of air infiltration through the brickwork setting. Mr. Thorman, the Engineer of the Stratford Works of the Gas Light and Coke Company, is to be congratulated on largely pioneering waste-heat recovery for vertical settings. He has shown that it is possible to obtain 5·36 lbs. of steam, at 115 lbs. working pressure, per lb. of fuel used in the producers (dry basis), and that the evaporation of waste-heat boilers is more than sufficient to meet all the steam demands of the average vertical installation with its full complement of auxiliaries.

Though in some respects the case as it relates to horizontal settings is less favourable, the following figures representing an average case will be of interest.

*Size of plant.*—2½ million c.ft.
*Settings.*—Horizontal: 15 beds of 10 retorts arranged in one bench of 8 and one of 7 beds.
*Coke consumption in producers.*—2200 lbs. of 12,000 B.Th.U. (net) coke per hour for the complete house.
*Waste heat temperature where available for a waste-heat boiler.*—650° C.
*$CO_2$ content at same point.*—12 p.ct. (approximately 100 p.ct. excess air).
*Working pressure of waste-heat boiler.*—120 lbs. per sq. in.

Under the above conditions the evaporation of a suitable fire-tube waste-heat boiler would be 8300 lbs. per hour from and at 212° Fahr.

It is interesting to estimate the approximate cost of generating this amount of steam, assuming the combustion of solid fuel in Lancashire boilers. It would be the exception for boilers of this type to evaporate more than 6 lbs. of steam from and at 212° Fahr. per lb. of fuel, assuming this fuel to be good-quality coke breeze. Thus the annual consumption for the Lancashire boilers would be about 5000 tons. If the Lancashire boilers are assumed to be fired with good-quality coke breeze, the market price cannot well be less than £1 per ton. Thus, on the concrete case we have outlined, there is a saving of £5000 per annum, and the elimination of the high charges for three shifts of stokers—an additional £400 or £500 per annum.

The capital cost of a suitable waste-heat boiler installation for this proposition, with full induced draught equipment and all auxiliaries, would be £3500 erected—a 15¼ p.ct. per annum investment! How many propositions are placed before the gas-works engineer showing as remarkable a return on capital as this?

A definite scheme has been outlined above; and completely to cover this case, reference must of course be made to the cost of running the induced draught equipment. The normal fan load would be 24 H.P. This fan drive could be a direct-coupled motor or turbine, geared turbine, or high-speed totally-enclosed reciprocating engine. In some gas-works the electric supply might be

inadequate, or there might be a predisposition against an electric drive, in which cases it should be clearly understood that the exhaust steam from the steam sets would be utilized for steaming retorts or heating the feed water for the waste-heat boilers. Whatever fan drive is decided upon, the cost of driving should at the very maximum be less than 20 p.ct. of the waste-heat boiler output; a closer estimate on an average sized installation would be 5 to 10 p.ct.

In conclusion, in view of the present cost of fuel, the state of the coke market, and high charges for labour and materials, this is a proposition which should be given the closest attention. Assuming the bottom falls out of the coke market in twelve months' time, it would even then pay to instal a waste-heat boiler, and throw it on the scrap heap after twelve months' steaming!

The moral of all this is: Take care of the excess air, and the steam will take care of itself.

## MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

### The Bradford Road Gas-Works of the Manchester Corporation.

On Saturday Dec. 6 the Association visited the Bradford Road Works of the Manchester Corporation Gas Department. Members assembled at the offices at the entrance to the works, and were welcomed by the Works Manager, Mr. A. L. Holton. The party were divided into seven groups of about twenty, and were conducted round the extensive works. The following gentlemen were the chief guides: Messrs. Hawkyard (Works Superintendent), Albinson (Works Chemist), Edmondson (Engineering Shop Superintendent), and Jackson (Chief Clerk). Mr. J. H. Sillitoe (Secretary to the Department) was unable to be present, and was represented by Mr. Rowlinson. A description of the works was given in the "JOURNAL" for March 8, 1922, p. 569. An interesting feature is that there are installations of Woodall-Duckham and Glover-West verticals, each of a capacity of 4 million c.ft. a day.

After the inspection of the works, tea was served in the offices.

The PRESIDENT (Mr. H. E. Stone) called upon Mr. Lupton (Liverpool) to move a vote of thanks to the Chairman (Sir Wm. Kay, J.P.), Mr. Sillitoe, and the Gas Committee, and to their old friend Mr. Holton.

Mr. LUPTON said he had been impressed by the magnitude of the works. All would agree that they had been well planned, and that the operations were wonderfully controlled. He thought that all would have learned a good deal from their visit, the arrangements for which reflected great credit on Mr. Holton and his staff.

Mr. CARTER (Liverpool), in seconding the vote of thanks, congratulated the President on the excellent attendance. It had been a record visit, and would, he thought, give their President a great deal of satisfaction.

The PRESIDENT said they rarely had the opportunity of viewing such large works as those at Bradford Road. On works like these it was possible to see plant of all types, and become acquainted with the latest practice. He was sorry that Mr. Sillitoe had been unable to be with them.

Mr. A. L. HOLTON (Works Manager), replying on behalf of Sir Wm. Kay, Mr. Sillitoe, and the Gas Committee, said that the Chairman of the Gas Committee was always pleased to do what he could to further the interests of the gas industry. It had afforded him much pleasure to meet so many friends.

The following paper was then read.

### NOTES ON THE DISTRIBUTION OF GAS.

By W. B. PAYNE, of Liverpool.

Those who have charge of, or are engaged in, the distribution of gas, find the conditions operating to-day somewhat different from those which obtained a few years ago. Since the passing of the Gas Regulation Act of 1920, it has become necessary to maintain, in services of 2-in. diameter and upwards, a minimum pressure of 2 in. water column at the meter inlet. The calorific value of the gas is in many cases lower than that formerly supplied. It may not be out of place here to consider what might be termed the new conditions of main and service laying, and distribution matters generally.

#### MAIN AND SERVICE LAYING.

An intimate knowledge of the undertaking's area of supply is essential. The portions capable of development for industrial purposes are naturally in close proximity to canals or railways, while the residential portions usually follow on those which already exist. A large-scale map should be kept for the purpose of recording new districts and roads. The lay-out of these roads can usually be obtained from the surveyor of the local authority, who invariably has them planned some time before they are actually made. In proportioning the mains for these developments, due consideration must be given to the amount of gas likely to be required beyond the development schemes actually in progress at the moment; and with this end in view, and where the levels of the land permit, it is good practice to lay a circular main near the boundary, bringing the smaller or branch mains inwards.

The peak load must be ascertained and provided for without any loss of pressure. In districts where housing schemes or large blocks of houses of the artisan class are built, the peak load is usually the cooking load on Sundays, when the majority of the cookers are in use. In planning the main for capacity, the total number of houses should be taken, and allowance made for a consumption of 80 c.ft. per house per hour. In better-class districts the peak load is usually in the evening, when cooking is taking place, with probably a dining-room fire and several lights burning at the same time. A consumption of 100 c.ft. per hour per house should be provided for in this class of property. In industrial areas the staple trade of the town should be taken into consideration, and mains laid accordingly, always leaving a margin for additional plant that is sure to be needed.

It is the better practice to lay mains in the footway on each side of the road, and thus reduce the liability to fracture, which is always existent where mains are laid in the roadway. Services are considerably shortened, and paving costs lowered when repairs or alterations are necessary. While the initial costs are higher, taking the average life of a service pipe at approximately 25 years, when renewals take place and the consequent re-instatement charges are paid, the balance is in favour of the double main. The position of the main in the footway should, whenever possible, be 2 ft. from the building line. Water and electricity take the position nearest the roadway, thus facilitating the arrangement of falls in the service pipes without any obstruction.

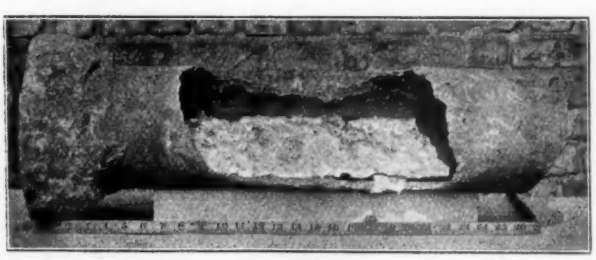
Co-operation between the district men of all public services is of great benefit, and should be encouraged. While each can maintain the rights of his particular department, great assistance can be rendered in many ways—such as the reporting of leaks or subsidences.

Care should be exercised when laying mains on made-up ground. This is usually rubbish from various sources, and the chemical action therefrom will quickly eat into and destroy the walls of the pipes. While adding slightly to the initial cost, it is far better to cart some good loam soil or sand to cover the pipes, and thus add years to the life of the main. Should any solid substances, such as old brickwork or tree roots, be in the way, they should be cut out and a 6-in. clearance given under the pipe; otherwise the main, being held rigid at that particular point, will readily snap if subsidence takes place on either side.

When making branch connections, the "under-pressure" machine is useful, and has the added advantage of wasting very little gas. There are positions where, owing to limitations of space, it cannot be employed, and the old method of cutting the main and inserting an outlet has to be resorted to. In these cases it is wise to make sure that the bags are good. It is advisable always to use two on each side of the cut, with a spare one in readiness for fixing if necessary. Wooden taper plugs, buffers, and plenty of good clay are also essentials, and should be handy. Too much care cannot be taken when this class of job is being executed, and the charge hand must always be in attendance until the joints are run. The early morning is usually the best time for this type of work; the men are then fresh, and the street traffic is at a minimum.

In the case of a main with the supply only one way, the requirements of the district beyond the point under operation must be ascertained, and either a suitable by-pass be fixed or due notice given to the consumers that the supply will be discontinued.

The greatest care must be taken when fixing saddle outlets. The area of the hole cut in the main should be equal to the area of the hole in the casting to be fixed. The holes should be tapped with full threads for the set pins, while the hole in the millboard packing should be cut slightly larger, so as to allow for expansion when tightening-up. Any obstruction at this point must be eliminated, as it is detrimental to the free flow of the gas, and will cause a drop in pressure.



**Photograph of Fused Pipe.**

When crossing electric cables, over or under, space should be left for a brick or some other suitable insulating material. This should be placed between the main and the cable, in order to prevent fusion should a fault in the latter take place. The accompanying photograph will effectively show how serious the neglect of this very necessary precaution may turn out to be. In this case a cable had been laid in an iron casing, and left resting on a 6-in. main which it crossed at right angles. The necessary repairs to this main were only carried out with great difficulty, owing to the escaping gas. This emphasizes the necessity for keenly watching the work of other public bodies or departments.

When arranging service pipes, the probable consumption should

be ascertained and a sufficient margin allowed for future developments. The best materials should be used for this work, and except in rare cases 1-in. diameter pipe should be the smallest laid under the ground. A long screw and backnut should be fixed on all service pipes near the main, for the purpose of cutting-off the supply of gas if desired. Outside stopcocks appear to be unnecessary on services of less than 1½-in. diameter, with the possible exception of lock-up shops and warehouses. They add considerably to the cost of the job, and are seldom easy of manipulation after being buried for any length of time. Again, they often give rise to claims for compensation, as children will play with the street-box lids, leaving them open or not properly closed, with the inevitable result that someone comes along and trips.

The question of charging for that portion of service which goes through private ground has often been a "bone of contention." There is much to be said for the view that the first cost only should be charged. This is usually a charge against the contractor; and if the consumer takes a supply of gas over a sufficient number of years for the service to become defective, any renewal should then become a charge on the gas. One has often seen big increases in consumption take place which necessitated a larger service being installed. The consumer has been asked to pay for this installation, thereby being penalized for increasing his load.

Frequent readings over the district should be taken with a pressure register. Standpipes may be permanently fixed for this purpose with a cover box; and street lamps or service pipes in new buildings may also be used. It can thus be ascertained whether any stoppage exists, or if mains are overworked, and whether there is oscillation due to a faulty gas-engine bag.

Before passing from the main and service portion of the paper, it may be well to say that every care should be taken in the selection of men for this work. They should, if possible, be trained by the gas undertaking, and care should be taken to choose men of sober habits and in every sense trustworthy. They should be encouraged to take an interest in their jobs, and where live gas is concerned to execute them expeditiously; otherwise the leakage account will rise enormously. Jobs should be grouped for economical working, good tools provided, and every opportunity taken of examining the mains and services when roads are being reconstructed. There should not be any hesitation in increasing or relaying mains or services when advisable. Good and clean records should be kept in the main books showing the positions, sizes, and depths of mains, syphons, &c., and also any other information likely to be of value in the future.

### INTERNAL FITTING.

The foreman or charge hand should be selected from the staff of fitters, with technical training and certificates, if possible. This gives a man of outstanding ability and energy an incentive to strive for something better. He should be tactful, energetic, loyal, and thoroughly master of his job. He should be encouraged to join the various Associations connected with the industry, and to attend their lectures. His duties should embrace the advising of customers, the preparing of estimates, and the general supervision of gasfitters' work. He should be in constant touch with architects and builders, and ready to advise on the most suitable, as well as up-to-date, method of lighting, heating, or cooking.

Particular attention should be paid to the staple industry of the area he is engaged in, as it is essential that he should be in a position to advise the use of gas for these industries, pointing out its adaptability, ease of manipulation, and labour-saving advantages. For instance, one would not look for metallurgical work in Bath or Leamington, while a great field for lighting, cooking, heating, and hot-water installations exists in those towns. In the big industrial centres, where large quantities of gas are used for furnace work or power, a man should be specially trained to deal with this branch of the industry. A great deal of useful information can be obtained in this direction from "A Thousand-and-One Uses for Gas." These publications are the result of actual practice in various districts; and those suitable for the particular industries in the area of supply should be obtained and sent to all the people engaged in the industries, with a covering-letter advising the call of a representative to give all the requisite information.

When determining the size of a meter, provision should be made to cover the greatest consumption likely at any time, and the consumption of a cooker should always be included. Even if this apparatus is not already installed, it is sure to be at a later date. In these cases there can be no doubt that the smallest meter that should be fixed is a 5-light, the day of the 3-light having passed.

In proportioning the internal pipes for lighting, the table compiled by the Manchester District Institution of Gas Engineers may safely be used, and is as follows:

| Diameter of Pipe. | Greatest Length in Feet. | Maximum Number of Lights. |
|---|---|---|
| In. | | |
| ¼ | 6 | 1 |
| ⅜ | 20 | 3 |
| ½ | 30 | 6 |
| ⅝ | 40 | 11 |
| ¾ | 60 | 18 |
| 1 | 80 | 35 |
| 1¼ | 100 | 60 |
| 1½ | 150 | 100 |
| 2 | 200 | 200 |
| 3 | 400 | 450 |
| 4 | 600 | 800 |

Gas as a lighting agent has passed through the furnace of an insidious and unfair criticism, but still survives, and is subject to the keenest competition from its younger rival electricity. It is admitted that there are both places and conditions in which this form of lighting may be used to advantage, as being better suited than a naked flame for certain work. As a general lighting agent, however, we do not yield anything to electricity. Gas is infinitely the superior light, it is economical in price, easy of control, better for the eyesight, maintenance costs are low, and it is a decided aid to ventilation.

An even distribution of light over the whole area to be illuminated should be aimed at, and to obtain this result it is far better to discard the old lighting points, which are usually in the centre of rooms, and put in a number of new positions. The light is thus broken up into smaller units for even distribution. With this end in view, care must be taken in the selection of burners. Only those should be used which are best suited to the district. The superheated type give the best duty per cubic foot of gas consumed. It is also advisable to use the best-quality mantles, and always to bear in mind the important part which the right kind of globe plays in good lighting. The accompanying diagram of tests may be useful.

In arranging the piping for appliances, the consumption per hour of each article should be ascertained, and the correct size of pipe accordingly laid. A separate range altogether from those used for lighting should be utilized; and when piping for a cooker,

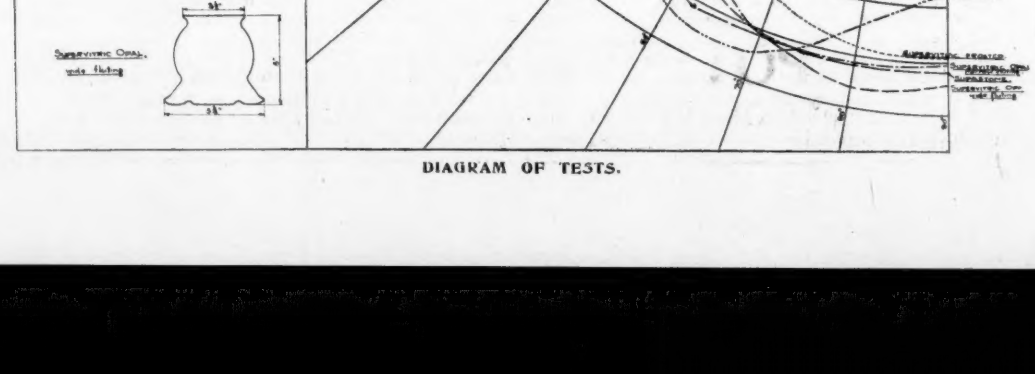
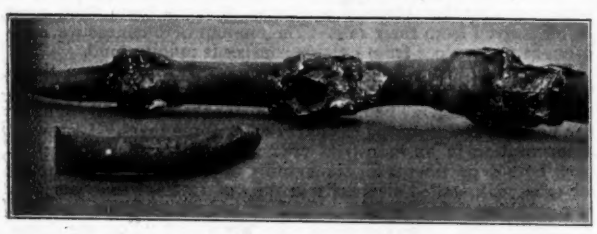



DIAGRAM OF TESTS.

circulator, or copper, at the rear of the premises, it is good practice to lay a size larger past the dining and drawing rooms, for gas fires at a later date. This method will save subsequent rearrangement or alteration, and will not materially add to the cost. Every job should be surveyed before the fitter is despatched, as often cases arise where an attractive-looking fire, which has been purchased in the showroom, is hopelessly unsuitable for the position in which it was intended to have it fixed. Further, flues should be examined for pull, cylinders for size, space and light for cookers, also the size and quantity of pipe required ascertained, which enables us to despatch the pipes with the article to be installed, and very often saves a wasted journey back to the shop for materials.

Fitters on district work should be properly trained men, and should be instructed in the best methods of pipelaying, an essential part of which is the giving of a necessary fall to the pipe, as well as the provision of a proper syphon, which should be fixed in an accessible position. It should also be made clear to them that the mastic or jointing material should only be applied to the male thread of iron pipes, and also that the branch pipe of a T joint on lead pipes must not be put too far in; otherwise an obstruction will be caused to the proper flow of gas. Solder must also be kept on the outside of the joint, and should not be allowed to run through. The photograph shows a pipe cut out from under



**Pipe Cut from under a Bedroom Floor.**

a bedroom floor—note the defective soldering. This emphasizes the necessity of having fitters who have been properly trained. The work in question was executed by the local plumber, who evidently did not realize the danger relative thereto. The cutting of walls and the taking-up of the flooring boards require great care, while a thorough understanding of the use and value of a pressure gauge is essential. It saves much valuable time in testing for soundness, stoppages in internal pipes and services, and the overworking of meters.

The adjustment of all burners and appliances calls for special attention, as the under or over aeration of the flame will account for loss of heat, and should be avoided. A course of instruction in these matters should be given from time to time, illustrated by lantern slides, or demonstrated with the actual appliance; and any improvements by the makers should be pointed out.

One cannot, perhaps, reach the ideal, but one can strive to get as near to it as possible; and the only way to do this is to train one's own apprentices. Classes should be held in the works every week for practical instruction—such as jointing, the bending of pipes, making of lamp brackets and cheap iron factory fittings, and the taking down and re-assembling of apparatus, adjustments, &c. They should be encouraged to attend the lectures for theoretical instruction at the nearest technical school, and their fees be paid. If this is not possible, classes should be arranged by the undertaking, as it is only by methods of this description that the right class of men will be available in the future. Economies should not be effected at the cost of the job in hand; but there are many ways in the distribution department in which a real saving may be made. No time should be wasted in obtaining the necessary material from the stores and in travelling to and from the various jobs.

Orders should be issued on duplicate papers, and for the purpose of costing the nature of the work ought to be clearly defined. Requisitions on the stores for materials should be made by a trained man. These requisitions should also be in duplicate. One portion of the papers should be assembled and fastened together, including a time-sheet and return paper for the fitter to enter his unused material. It is advisable that one portion of the requisition paper be passed to the stores, in order that the material may be looked out and placed on the counters ready for immediate handing to the fitter when applied for. Small stores may be put in brown paper bags, with the requisition papers on top—the latter being kept in numerical order. The jobs should be on the counter at starting-time each morning, sorted into districts; each class of work being kept separate and ready to hand-out promptly. A record of the job numbers, together with the fitters' names, can be entered roughly in a book, which may also record any disbursements made. These particulars can afterwards be properly entered into the official books.

Upon being handed a job, the fitter should immediately present his duplicate requisition paper at the stores counter, and after obtaining the material sign the stores duplicate for the same, which is then passed direct to the costing department. On completion of each job, the fitter should make-out a return paper (in duplicate) for all unused material, one portion of which would pass into the stores with such material, and subsequently go direct to the costing department. The remaining portion of the return paper, together with the requisition paper, order paper, and time sheet, would be handed in at the office each morning along with the fitter's time book. By these methods a hundred men can be dealt with in 20 to 30 minutes each morning. The official responsible for giving-out the work should be intimately acquainted with each man's capabilities, and should also have a thorough knowledge of the area of supply.

Complaints ought to be dealt with by skilled men, and not filed until the consumer is satisfied. A visit from the district man, on his ordinary round, after the fitter has been, is an advantage, and leaves a good impression. It must always be borne in mind that a satisfied consumer is the best advertisement, while a dissatisfied one does incalculable injury. The gas industry is particularly well placed for keeping in touch with consumers, as the ordinary meter readings alone are a great help in this direction. Inspectors on this work should report any complaint that is made to them, for further attention and investigation.

In conclusion, it may be well to point out that since an altered calorific value of gas has come into general use, there must be a very large number of appliances all over the country that are not giving the good duty which is necessary—particularly those with the fixed nipple and no air regulator. One realizes that it would be far too costly a job to scrap these appliances, but nipples of the correct size with loose air-regulating sleeves can easily be fixed at very little expense. Where the appliances are on hire or the property of the undertaking, this should be done as soon as possible.

### Discussion.

The PRESIDENT said the author had given them a really practical paper, which would be very useful. It was no use having a good works and plant if there was not a good distribution department to follow up the work of manufacture.

Mr. GRIFFITHS (Accrington) said he was surprised the author considered it unnecessary to put a stopcock on services of a diameter less than 1½ in.

Mr. TEASDALE (Salford) asked if Mr. Payne had much difficulty in getting a full 2-in. pressure at the meter inlet. He had found that the street lamps gave very indifferent results. They were unable to get steady pressures at the lamps.

Mr. LIVESEY (Stretford), regarding the question of charging in the case of an enlargement of the services, asked why the cost should not be borne by the consumer.

Mr. HAILSTONE (Rochdale) agreed that all flues should be first examined by the inspector.

Mr. HEALD (Preston) was pleased to hear that 100 men could be dealt with in 25 minutes. They at Preston had dealt with 42 men in about the same time per man. He agreed as to the importance of inspecting all new work. He mentioned the difference in the amount of scrap lead for sale since they had adopted that method. With regard to stopcocks, there was difficulty in keeping them in order.

Mr. PRINCE (Heywood) considered free maintenance a sound business proposition.

Mr. PAYNE, in reply, said that stopcocks were too expensive, not in the first cost, but in maintenance. With regard to Mr. Teasdale's observation, they made a practice of connecting-up the ends of the mains wherever possible. It was a good thing to have a circular main laid round the boundary of the district, and the mains connected to this. Pressures were taken daily. Permanent stand-pipes were installed for this purpose. Constant pressure was, of course, the ideal. Liverpool had several stations, and it was an easy matter for them to get in touch with any particular district and put matters in order when necessary. They tried to keep a constant pressure of 30-tenths over the whole of their district. If gas consumers of long standing increased their loads so that a larger size of main was required, the consumers should not have to bear the cost of the new piping. Often business was lost by not supplying the second service free. It was necessary to see that the flue was capable of dealing with a gas fire without causing a down-draught; and all work should be passed by the inspector, to make sure that the consumer was satisfied. Over a test taken that day, 93 fitters had been dealt with in 27½ minutes. Free maintenance was a big matter, and could cost 1¼d. per 1000 c.ft. Personally, he was not in favour of it, as free service was very often abused.

Mr. HAILSTONE (Rochdale) moved, and Mr. PRINCE (Heywood) seconded a vote of thanks to the author for his paper, to which Mr. PAYNE replied.

The meeting then closed.

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**Cleaner Air.**—How to provide healthier conditions in buildings was dealt with in a paper on "Air Washers and Filters," by Mr. H. W. S. Martin, at a meeting of the Institution of Heating and Ventilating Engineers last Wednesday week at the Engineers' Club, London, W.C. Mr. Martin stated that in any large town the necessity for washing and filtering the air, to cleanse and remove the soot and smoke before passing it into a public building, was fully recognized. Soon, perhaps, the health authorities would insist on the smoke nuisance being stopped, or at any rate very greatly mitigated; but until that time came, air washers or filtering apparatus in connection with a plenum heating or ventilating plant for a public building was essential. The most desirable conditions for a public building required humidity of the air. The short, dry cough heard repeatedly in a theatre or church was a clear indication that the air was too dry. It was the medical man who should determine what was the best and most healthy standard condition; and then the heating and ventilating engineer should design his apparatus to maintain this.

## SCOTTISH JUNIOR GAS ASSOCIATION.

### (WESTERN DISTRICT.)

The third meeting of the session was held in the Royal Technical College, Glasgow, on Saturday, Dec. 8—Mr. John M'Isaac, President, in the chair.

Mr. J. Murray (Hon. Secretary) intimated that a sum of £102 had been subscribed by the various societies in the College towards the cost of the cinema projector, which was to be presented to the College Authorities. Their Association had subcribed £5.

The following paper was then read.

### RAMBLING REMARKS ON DISTRIBUTION.

By James Graham, of Kilmarnock.

It is readily agreed that future progress depends upon the efficiency of the distribution department. Each individual member must be an expert in his own particular line. He must be qualified by examination to hold his position. Before considering the future of the distribution department, let us briefly consider why it has not made equal progress with the manufacturing side. In the majority of undertakings, the distribution department has been under the sole control of the manager—the man who has brought the manufacturing side to such a pitch of perfection. I believe many of these men are responsible for the backwardness of their distribution departments. They looked upon distribution as a necessary evil which had to be suffered; and it is only within recent years that they are finding it to be their most important task. It was thought unproductive and a revenue waster. It required more men to run than did the works, and brought no return. The reduction at the end of the financial year, which should have been 6d., had to be reduced to 3d., to make up for the money it had wasted. The job of supervising the department was in the hands of the senior clerk and foreman fitter. It did not pay to appoint a specialist—besides, who specialized in this class of work? Only the few in the large undertakings. Many of these managers gained their first insight into distribution work when they were first appointed. They had no experience as organizers. The men carrying on the work of distribution got no encouragement to fit themselves for something better. In fact, there was nothing better to strive for. The foreman on the works ranked higher. He had a chance of becoming a manager. This is the position in a number of works to-day. Lack of keen competition and lack of foresight are the reasons why the distribution side is not on a par with the manufacturing department. Fortunately for our industry, the distribution side has not been entirely neglected. Some of the large concerns have specialists in this class of work, and they are treated as such. These undertakings have realized the value of educating their staff, and are doubtless reaping their reward in efficient service.

It must be admitted the distribution side in general has not, up to the present, offered much incentive for this class of man. With some exceptions, it is principally the medium and smaller works where more scientific methods are badly needed. Where bad organization exists, there is often a lack of faith as to the future. There is no room in our industry to-day for men of little faith. To-day, as never before, our industry needs keen, enthusiastic, ambitious men. The remuneration at present is not such as is likely to attract an energetic "go-ahead" business man. In considering the future career of a son, such a man would hardly contemplate gas distribution as a possible outlet for his talents. If he were to look through the Technical Press for the past two years, he would find that during this period only two undertakings over 500 millions output advertised for a man to take charge of their distribution departments. Would a 500-million works repay such a man for all his years of study? I doubt it.

Let us now consider the distribution department of the future. The large company concerns have glorious prospects. They are not hampered by municipal restrictions. There are towns where both gas and electricity are municipally owned, where anything in the nature of push on the part of the former is looked upon with disfavour. Will such towns as these appreciate the value of a real live distribution department? The British Commercial Gas Association have accomplished remarkable things in ten years; and I have hopes of their showing such "stick-in-the-mud" corporations where the public interests lie. Recently I heard of a provost in one of the most progressive towns in Scotland who said that in ten years' time gas would not be used in the homes of this country. Needless to say, at the time he made these remarks, he was the electricity convener. Whether or not he believed such piffle I am not prepared to say; but from his remarks one would hardly expect him to sanction anything that savoured of progressiveness on the part of the gas department. Should my remarks appear pessimistic, I am pleased to say that in this particular instance the gas department have an engineer capable of handling the situation—a man who has studied distribution, and trained his staff accordingly. While the gas department are making substantial increases in their output, and selling gas at less than pre-war price, the sister department are capitalized up to the hilt, losing money in tens of thousands, and existing on prospects. The present electricity convener, who is carrying on the electricity campaign (the all-electric house) laid down by his predecessor the provost, has an all-gas house.

The majority of corporations do not believe in competition between the two departments. If we are to continue to forge ahead, we must have competition. Even in municipal undertakings we must be allowed to show what we can do. Electricity is being adopted for various purposes in houses, irrespective of its merits. People are being carried away by the propaganda of its advocates. In places where the gas and electricity departments are jogging along, and taking what is given to them, the gas department is bound to be the loser. In such towns the local electricians are working at top speed, in some cases carrying-out a house-to-house canvass. The electricity department are having business brought to their door. The local plumbers and gasfitters were never one-tenth part as valuable to the gas industry as are the electricians to their industry. Gasfitting with the plumber is usually a sideline—a job for the apprentice. How many plumbers have showrooms for the display of gas apparatus? I have heard of them working hand in hand with the gas undertaking; but it has generally been with a company concern. I have never heard of plumbers canvassing for new gas appliances, but I have known the gas department to canvass for new work, of which the local plumber was given share. Indeed, they claim it is their right as ratepayers. So much for the assistance from the plumbers. The ironmonger is of less value to us than the plumber. He certainly makes a show of gas fittings. The class of goods, however, stocked by a number of these people is of such a quality that there is a danger of more harm than good being derived from their sale. The amount of business we have brought to our door from outside sources is infinitesimal.

The gas industry will need to keep a watchful eye on these towns where both departments are municipally owned. This is our weakest point. The industrial side of the electricity industry has been badly hit during the past two or three years. I know of a corporation in an industrial area who, after asking for prices from both departments for the lighting of new streets and a housing scheme, installed electricity in spite of the fact that gas was 30 p.ct. cheaper for initial cost and maintenance. The decision was unanimous. The gas department were told "You are doing very well, we must help the lame duckling." This is a precedent which may easily become a standing order. To prevent this sort of thing from becoming a habit, will need more than an efficient distribution department. It needs the whole-hearted co-operation of the entire gas industry.

In my experience, in certain towns where both gas and electricity are under a municipal authority, the electric side has first choice, and gas takes what is left over. The electric side gets the lighting and power, and wherever possible the heating and cooking. Soon it will make a bid for the industrial side.

Most new houses are electrically lighted, and some are wired for heating. In numerous cases the electricians are allowed to canvass the gas-lighted houses with a view to—as they put it—"modernizing" them. The one side is allowed a free hand, while the other is not given a sporting chance. For our own sake, and for the sake of the public, fair competition must be allowed. Monopoly in the past retarded the progress of our industry; competition has advanced us to our present position. Municipally-owned undertakings are at a great disadvantage. Unlike the directors of a company, gas committees are not all enthusiasts. Some of the men who form these committees, where the two undertakings are municipally owned, are members of both. These men are easily swayed by the sensational Press, and are often blind to the interests of the public. Municipalization is a severe drawback to the progress of our industry.

In trying to visualize the future, the necessity for only the fittest is written in clear letters, but the incentive is very obscured. Fighting may be a natural instinct with some men, but the man who trains himself to the last ounce is not just fighting for the love of it. He is aspiring to some goal. What goal has the gas industry to offer such a man? This is a question for those who are laying-down the standard of education. As the years roll on, competition in all classes of business becomes more keen; the necessary training becomes more intense, but the beginner has opportunity to choose, and will select, the one where the prospects are brightest. We ourselves have no doubt of the possibilities of gas. It has an almost unlimited field. An ambitious young man will not, however, give this much consideration if the reward is better elsewhere. Promotion is very slow on the distribution side of our industry, probably because it is overcrowded, combined with the fact that a large number of undertakings train their own staff. The vacancies in these works are never thrown open in the general market. This considerably limits the field of the distribution man. The young man who is to make a hit on the distribution side must study the geographical conditions before joining any undertaking. If he commences his career in a small concern, his chances are likewise small. Distribution on small works does not allow of the apparatus and plant, scientific methods, and organization of the large towns. He will probably find it difficult to obtain the necessary technical training. The nearest training centre may be too far away. His enthusiasm would in all probability soon diminish. Assuming he overcomes all these difficulties, and passes the examination laid down by the Institution of Gas Engineers, will he be sure of a good billet? He will certainly have earned it. As I see it, the man who aspires to the big jobs in distribution must join a large concern, preferably a company, and by enthusiasm and outstanding ability gradually work his way to the top.

In the future, as in the past, in smaller places the manager will

still be the distribution specialist. I include salesmanship as part of distribution. If this side of the business is to become more progressive, it would appear that the budding manager will need to include more distribution and commercialism in his training than hitherto. The Diploma of the Institution goes a long way towards embodying the necessary qualifications. The salesmen's circles will very considerably assist. When the scheme for commercial training is in operation, we ought to be turning out the type of man required to uphold the traditions of our great industry.

The ability of these men will need to be recognized in more practical form than is at present the rule. I will give you an instance of how the salary in our profession compares with that of the electricity man. Some two months ago there appeared in the Technical Press an advertisement for a manager in a 115-million works, at a salary of £400. In a town not many miles distant the man in charge of the electricity showrooms received a similar salary. I have no doubt that most of you could relate other such cases. The modern manager in the smaller towns will train his own specialists—I mean his chief distribution man and salesmen. Having previously passed through the whole routine, he will be competent to do so. Like the small provincial football teams who are unable to buy talent, he will need to search for likely local recruits. He will do well to see that he has nothing foisted upon him. Municipal concerns, particularly the smaller ones, have ever been dumping grounds for relatives and friends of a certain type of councillor.

With the right type of youth the training should commence in the office, under the manager's eye. First instil enthusiasm in him, and the remainder should be simple. He should be given an elementary training on the works, and later passed through the workshops and finally on to the district. During his practical training he should be encouraged to study the technical side at home. Technical literature should be passed on to him; and it would certainly pay to devote at least an hour a week in person to his technical training. During his apprenticeship he will pay his way, and eventually will develop into a useful asset. Even though the student be successful in obtaining a better position at the end of his preliminary training, the manager will have the satisfaction of knowing he has done his duty to the youth and to his industry.

The successful manager has another duty to perform—namely, the education of the consumer. To be a qualified success he must be a social man. He must mix among the public. An occasional address to a woman's guild or to a ward committee can do a vast amount of good. Large and small concerns alike must exploit the field to the fullest, canvass intensively, advertise as much as possible, never retreat. Let the opposition be aggressive. We have the goods; let us deliver them.

The appliance manufacturers have given us 50 p.ct. efficiency for cooking, and much more for heating; but with the introduction of their research laboratories, and the co-operation of the scientific distribution man, I fully believe we shall hear more good news from them in the near future. The industrial apparatus makers have only of recent years settled down in earnest. They have a career before them. I see no limits to their resources. This branch, above all, demands specialists.

Let enthusiasm be our keynote. A short time ago an electrical engineer asked me to instal one of the new types of hotplate. He desired it to be fitted with a flexible connection, in order that it could be put out of sight when any intimate friends were admitted to the kitchen. His electric cooker was retained for show purposes.

### Discussion.

Mr. J. BOYLE (Greenock), opening the discussion, congratulated the speaker on the fearless manner in which he had spoken. He thought the man in the small undertaking could get promotion if he was willing to work hard enough. As to keen competition, they should not sit down to it, but by an efficient service combat it. It was said that gas was neither handy nor clean. There was something for the distribution departments to tackle. In this respect he thought maintenance would effect a solution. They could also bring the pneumatic switch prominently before the public, and thus retain the lighting load. Often when electricity was used for lighting, there was a tendency to employ it for heating, &c. Distribution departments could not place too much importance on the retention of gas for all forms of lighting.

Mr. R. GRAY (Hamilton) remarked that distribution was now much more efficient than formerly. It was no longer looked upon as a burden for the manufacturing side to carry. He thought it very unfair for gas consumers to bear the loss on electricity undertakings, such as happened when gas and electricity were under the control of the same municipality. Gas was certainly progressing.

Mr. A. WALKER (Kilbarchan) suggested that the old saying "Profits are made in the retort-house" no longer held. He welcomed the schemes to educate juniors; this in time would solve many of the present-day troubles. He instanced the benefits of a maintenance scheme.

A number of other members joined in the discussion; and at the close Mr. Graham was cordially thanked for his paper.

A whist drive and social evening will be held on Saturday, Dec. 20, at Rombach's, Waterloo Street, Glasgow.

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**Yorkshire Junior Gas Association.**—The University of Leeds, where there are celebrations this week, will on Saturday be visited by members of the Yorkshire Junior Gas Association, who will be received by Mr. J. W. Wood at the Main Entrance, University Road, at 2.45.

## Ash-Softening Temperatures and Clinker Formation.

The United States Bureau of Mines set forth, for a number of coals, in a recently-issued report, the approximate analyses, ash-softening temperatures, softening intervals, flow intervals, and tendency to form clinkers, when burned in a high temperature power plant furnace. Heavy troublesome clinkers resulted with the coals whose ash-softening temperatures were from 2200° to 2300° Fahr.; troublesome clinkers usually resulted with the coals whose ash-softening temperatures lay between 2300° and 2500° Fahr. With few exceptions, coals whose ash-softening temperatures were above 2500° Fahr. gave little trouble from clinker formation. The analyses of different samples of the same coal did not vary appreciably, yet the ash-softening temperatures of different samples from the same coal were found to vary rather widely—as much as 290° Fahr. in one case. Hence a number of determinations should be made on samples from different shipments, in order to secure a fair average value for the ash-softening temperature of a given coal. When the ash-softening temperature is properly determined, it can well be used as one of the guides in predicting the action of the coal in the furnace.

## Oil from Low-Temperature Carbonization.

While admitting that the low-temperature carbonization of coal for the extraction of oil alone can never be a paying proposition so long as the present economic relationship between coal and oil exists, Messrs. Nash and Shatwell have put forward, in a paper read before the Institution of Petroleum Technologists, the calculation that, if the small coal mined every year, amounting roughly to 50 million tons, which is now unutilized, were treated by some system of low-temperature carbonization, about 365 million gallons of liquid fuel would be available annually, apart from the yield of good solid fuel suitable for domestic purposes. That oil from carbonized coal can never replace natural petroleum is, they say, shown by the fact that, in addition to its being of poorer quality, the variety of products is very limited, and there is a high percentage of low-quality pitch left as residuum. Nevertheless, by supplementing, it can help to conserve the natural mineral oil resources, and the objectionable high content of unsaturated hydrocarbons in the motor spirit fraction might be overcome by careful physical, in preference to chemical, refining and blending with motor spirits composed principally of paraffin hydrocarbons.

## Seal for Purifiers or Scrubbers.

At the annual meeting of the Pacific Coast Gas and Electric Association, a description was given of a seal adaptable to liquid purifiers or scrubbers, which has been installed and is giving satisfactory results at various points on the system of the Pacific Gas and Electric Company. It has been found that, where the nature or velocity of the fluid employed in liquid purifiers is such that gas bubbles are entrained in the fluid, the ordinary dip-pipe hydraulic seal is not satisfactory, as the gas bubbles are carried through the dip pipe and rise through the liquid in the seal pot, escaping at the top. This constitutes a fire hazard, as well as representing an extensive loss of gas. The seal consists of a gas-tight steel seal pot, with the inlet from the purifier or scrubber entering above the fluid level, and the overflow outlet at the bottom. There is fitted a steel shoot which extends from the inlet opening to the fluid level when pressure is on the seal; and a vent pipe leads from the top of the seal to the purifier or scrubber shell. With this arrangement in use, the fluid enters the seal through the inlet, and runs down the shoot to the level of the fluid in the seal pot. This decreases the impact, and causes a minimum amount of turbulence in the liquid. The gas bubbles are released on top of the liquid, and escape through the vent back to the purifier or scrubber shell.

## Shale Oil Resources.

Though the search for oil shale has not yet been prosecuted with any great seriousness, it is, say Messrs. A. W. Nash and H. G. Shatwell, known that deposits exist in practically every civilized country in the world. The shales of Esthonia have been experimented with in the Scottish type of retort, and found to yield 77 gallons of crude oil per ton; but the sulphate of ammonia yield is poor. The various oil shales of America give from 10 to 90 gallons of oil per ton, with an ammonium sulphate yield of from a few pounds to 34 lbs. The New Brunswick shale deposits of Canada, when tested in Scotland, furnished an average of 40 gallons of crude oil and 78 lbs. of ammonium sulphate per ton. Those of Southern France yield from 80 to 120 gallons of oil per ton; while the Australian shales are reported to give 100 gallons of oil and 70 lbs. of sulphate of ammonia per ton. The United States Government are holding 45,440 acres in Colorado and 86,584 acres in Utah of oil-shale deposits as a reserve for the use of the American navy. The Colorado oil-shale fields cover an area of 2500 square miles, and those of Utah are 125 miles long by 40 miles wide. The quantity of oil shale estimated to be available in the Utah district is more than 40,000 million tons, and in Colorado 19,360 million tons, with an average yield over the whole of 38 gallons of oil to the ton. This represents a potential reserve of oil corresponding to 8550 million tons. There are various reasons why the enormous shale-oil deposits have not yet been worked seriously, but the principal one is the present abundance and cheapness of petroleum in its free state.

# CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

## A Distinctive Sign for the Therm.

SIR,—For many months past I have used in my own notes and records the symbol $\overline{\text{Th}}$* in place of the word "Therm" (singular and plural), and it occurs to me that the time may have arrived when some such distinctive sign might be generally adopted to represent a word so extensively used throughout the gas industry.

No doubt many of your readers have found the need for a convenient abbreviation in this connection, and I suggest that a lead from the "JOURNAL" would be useful.

W. WASTELL, Secretary.

*South Suburban Gas Company,*
*Lower Sydenham, S.E.,*
*Dec.* 13, 1924.

[* The symbol represents the combination of a capital "T" and a small "h." The type-founders have not answered well to the exigency.—ED. "G. J."]

## Use of Live Steam in Purification.

SIR,—In reference to the second paragraph in the paper read by Mr. F. J. Pearce at the recent meeting of the Southern Association of Gas Engineers and Managers (*ante*, p. 723), I would remark that the use of steam for revivifying oxide of iron without removal from the purifier was first suggested by Mr. Robert Fish, in a paper read before the 1872 meeting of the British Association of Gas Managers, entitled "The Comparative Cost of Purifying Gas by Lime and Oxide of Iron"—see the "Transactions" for that year, p. 66. The paper, and also the discussion following, turned somewhat on the question of oxide *versus* lime, as at that time many engineers had a preference for the latter. The method proposed, and applied, was claimed to have reduced the purification costs from 0·75d. to 0·25d. per 1000 c.ft. of gas purified; and the following is the description given (p. 67):

When the purifier requires changing, the gas-ways are, of course, closed, and the air-ways opened; a tap is then turned, and steam passes through the nozzle into the purifier. The effect of this is to cause a rapid current of air to pass through the purifier and permeate the purifying material, then to pass into the outlet, where it is thoroughly diluted with steam, after which it rapidly ascends and mingles with the upper air. Thus by the employment of steam in the manner described there is not only a sufficient current of air induced for a complete revivification of the oxide, but the use of it keeps the purifying material from getting unduly heated, and produces that degree of dampness most suitable for this purifying agent.

In the course of discussion, reference was made to a somewhat similar process in use at the Bath Gas-Works, where purifiers were run for six months without change. Twenty years later, Mr. F. G. Dexter read a paper, on "Steam Applied as Aid to Purification of Oxide of Iron *in situ*," before the Gas Institute ("Transactions," p. 38). He went fully into the science of the subject, making special reference to the use of pure oxygen in preference to air, which at that time was under consideration, and claiming that his procedure secured all the advantages, without the expense, of the former. He had adopted continuous, as distinct from intermittent, revivification, which enabled the working life of a charge to be greatly prolonged, and this without removal from the box or cessation of the flow of gas through it. He also dealt fully with the advantages of steam, as compared with those of dry air.

Mr. Dexter followed the subject in a second paper in 1894 ("Transactions," p. 223, *et seq.*), and then claimed to have reduced the purification costs from 0·7d. per 1000 c.ft. of gas in 1890 to 0·24d. in 1891 by use of air alone; as the result of adopting steam, this was further brought-down to 0·07d. in 1893.

Personally, I have been concerned in the use of air for revivification *in situ* for more than forty years, but have never resorted to steam, simply because the necessity was not evident. The results obtained were equal to anything gained by the use of steam.

Later advances on the same lines appear to have turned on larger purifying areas. The reduction of temperature by exposure to air in winter has been limited by substituting the underground for the overhead plan, the increase of size favouring the ground floor; and working facilities suggested the advantage of burying them to such extent that the top surface is not more than about a foot above ground, lagging the sides and covers, and periodically reversing the flow of gas.

N. H. HUMPHRYS.

5, *Wyndham Road, Salisbury,*
*Dec.* 13, 1924.

## Maintenance of Gas Appliances.

SIR,—After reading your editorial in yesterday's "JOURNAL" entitled "Organizing Good Service," I feel impelled to write and congratulate you on the views expressed therein. There will be, no doubt, many like myself who would support your plea for full maintenance of gas apparatus—not only gas fires, but all the many and varied appliances in use on the district. I hope you will keep pegging away at this subject, which is of infinitely greater importance to the future well-being of the industry than the more popular topic of "Verticals *v.* Horizontals."

At the present time the gas industry is in a very flourishing condition, and orders for appliances are coming in faster than they can be executed. This seems to be the general experience, and it is quite natural that it should cause a slackening of the interest taken in the question of free maintenance.*

There are two reasons for this. In the first place, the increasing business tends to promote a feeling that there is really not much to worry about, and that, if a little business is lost here and there because of faulty appliances, this really cannot be helped, and the consumer is himself to blame if he will not ask for his appliances to be put in order. The second factor is the shortage of skilled gas-fitters, coupled with the difficulty, brought about by the housing shortage, of moving men from place to place.

You will, no doubt, recall the second of Mr. Butterfield's recommendations: "That the gas industry be asked to submit to the Board of Trade . . . suggestions for a system of periodical inspection and of maintenance in safe condition of gas piping, fittings, and appliances. . . ." Is it not apparent that, from every point of view, maintenance of all appliances is the ideal at which to aim? If this be admitted, the problem which will then arise is the difficulty of find sufficient men to double, approximately, the gasfitting staffs now employed. Most undertakings are already training apprentices; but personally I am of the opinion that the problem is so huge that it will never be properly solved without a co-operative effort, and that it will become necessary to establish training centres in various parts of the country, at which intelligent youths can be instructed *by the hundred* to fill the demand which is bound to come. It is to me surprising that gas undertakings should spend thousands of pounds on elaborate showrooms designed to convince the public of the merits of gas, and that they should then grudge expenditure in the houses of the consumers themselves, where the impression produced is ten times more important.

I apologise for the length of this letter; but, as you rightly observe, the matter is of fundamental importance, and I should like to see the last part of your editorial printed in letters of gold, and circulated broadcast. I have long held these opinions, and as far back as 1911 wrote a paper advocating maintenance of all appliances. [See Reports, Gas Associations, 1911, p. 72—Midland Association.]

W. W. TOWNSEND,
Engineer and Manager.

*Gas Company, Colchester, Dec.* 11, 1924.

* P.S.—The reference is to systematic house-to-house maintenance of all gas appliances free of charge as far as labour is concerned, materials being charged for. Details of schemes in operation have been given by Mr. J. W. M'Lusky, of Glasgow, and Mr. H. E. Bloor, of York.

# REGISTER OF PATENTS.

## Manufacture of Briquettes.—No. 223,302.

LAING, B., of Hatfield, and NIELSEN, H., of London.

No. 18,461; July 17, 1923.

This invention relates to two-stage methods of distilling carbonaceous materials and manufacturing briquettes, of the kind in which the solid material is withdrawn from a primary stage retort when it reaches the so-called "sticky" stage, and, while the material is still in a plastic or semi-plastic condition, is moulded or subjected to pressure within a suitable apparatus so as to consolidate it into briquettes; the briquettes being subsequently subjected to a further distillation process at higher temperatures in secondary-stage retorts.

According to the present invention a plurality of internally heated retorts is provided for carrying on the primary and secondary stages of distillation, and a continuous stream of hot gases is passed from the secondary-stage retorts into the primary-stage retorts, so that the heating of the carbonaceous materials in the primary stage is effected by the same gas which has been utilized in the secondary stage. In other words, the primary and secondary stages of heating are both effected in the same gaseous atmosphere. The briquettes, without any subsequent cooling and while in the hot state, are continuously conveyed into the secondary retort, where they are distilled at a higher temperature. Owing to this fact little or no heat is lost by the passage of the carbonaceous materials from the primary to the secondary stage, and considerable economy in heat requirements is effected. A supply of pitch or agglomerating material is added to the primary retort before briquetting; this step being feasible owing to the low temperature at which the primary retort is worked.

## Gas Fire Radiants.—No. 223,717.

GENERAL GAS APPLIANCES, LTD., and FRANCIS, W. R., both of Manchester.

No. 24,243; Sept. 29, 1923.

The invention has for its object to provide a radiant which "lights-up" quickly, or has the appearance of being incandescent before the whole of the radiant is incandescent, the arrangement also being such that a considerable glow can be obtained with a very small consumption of gas. For this purpose the radiant is provided with strands or threads of asbestos fibre which are laced through holes in the sides of the radiant and extend across the interior, producing a criss-cross effect.

## Atmospheric Burners.—No. 224,029.

RICHARD KAHN AKTIEN and CLASEN, W., both of Berlin.

No. 21,710; Aug. 28, 1923.

This invention relates to improvements in atmospheric burners for heating purposes of the kind comprising an injector tube one end of which projects into a concentric inner cup-shaped part secured to the gas inlet nozzle and projecting into an outer concentric inverted cup-shaped part secured to the injector tube; the burner head being provided with lateral outlets, and the passages

thus formed between the cup-shaped parts and injector tube providing a pre-heating device for incoming air.

The modifications relate to the general design of the burner, and to the provision of an air regulator.

### Prepayment Mechanism.—No. 224,143.

ANDERSON, J., of Edinburgh.

No. 6090; March 10, 1924.

This invention, in brief, consists in prepayment mechanism having a pawl pivoted to the coin carrier and provided with a radial tooth engaging the periphery of a measuring-out wheel of the spur gear type. The pawl is so arranged that it is definitely engaged with the measuring-out wheel on insertion of a coin by the action of the periphery of the coin, the prepayment mechanism casing or the like, and a connector between the coin carrier and the pawl, but rides over the teeth of the measuring-out wheel after release of the coin or when no coin is carried in the carrier.

A form of the invention is described and illustrated in which the prepayment mechanism and measuring-out wheel are contained in a circular casing closed by a prepayment disc held in position by a retaining ring, the character of casing disc and ring being that shown in patent No. 208,181 [see "JOURNAL" for Jan. 16, 1924].

### Waste Heat in Carbonizing.—No. 224,179.

SPENCER-BONECOURT, LTD., and GREGSON, W., both of Victoria Street, S.W. 1.

No. 13,135; May 28, 1924.

Introducing this specification the patentees say that for efficient service a waste-heat boiler should be worked on induced draught. This necessity for induced draught and also the draught requirements of the retort setting and regenerators, if any, means exhausters driven by a reciprocating steam engine or a steam turbine, if electric power is not available or desirable. The power required, however, is not great; and steam engines of low power, particularly steam turbines of low power, are not as efficient as could be desired, and if moderately efficient are expensive. It is one object of the present invention to enable an inefficient and cheap turbine or other steam engine to be used in an efficient manner in the retort installation.

Usually steam is admitted into retorts at comparatively low pressure, and this steam may be saturated or superheated. On the other hand, it is usual to generate steam in a waste-heat boiler at pressures of 100 lbs. per sq. in. and over. According to the present invention, in order to avoid waste of a large proportion of the steam generated by the waste-heat boiler by consuming it in an inefficient turbine or reciprocating engine, the steam is allowed to escape from the turbine or engine at a suitable pressure for the retorts (say 30 lbs. per sq. in.) and is used in the retorts, preferably after it has been dried by passage through a steam separator.

It is also suggested to superheat the steam before it is blown into the retorts, either by passing it through a superheater in the inlet products chamber of the waste-heat boiler or in the flue leading thereto, or by a separately fired superheater.

### Bricks for Regenerators.—No. 224,368.

MASTERS, E., and GIBBONS BROS., LTD., both of Dudley.

No. 26,963; Oct. 29, 1923.

This invention relates to the bricks used for the gas and air passages of a regenerator.

One claim is for a tubular brick having a plurality of openings in each of two opposite sides; the openings extending substantially the whole width of the brick, and the other sides of the brick being unperforated. Another claim is for a brick with only one opening in each of two faces; and there is a provision for constructing alternate courses of two different kinds of a further type of tubular brick.

### Distillation of Tar.—No. 224,305.

CHEMICAL ENGINEERING & WILTON'S PATENT FURNACE CO., LTD., of Victoria Street, S.W. 1, and SHADBOLT, S. M., of Lee, S.E. 13.

No. 20,574; Aug. 13, 1923.

The invention relates to the distillation of tar in what are known as pot stills as distinct from continuous stills, and has for its object the provision of improved apparatus for this purpose. It particularly relates to the method of distillation in which the tar is preliminarily heated and is dehydrated by being heated under sufficient pressure to prevent the escape of vapour, and is then delivered in a small stream or streams into a closed vessel from which the water and some of the lighter fractions escape as vapour, after which the tar is led to pot stills.

According to this invention, the dehydrated tar is stored in a container of large capacity before it is run into the pot still, so that the pot still may be more readily charged and more continuously used, and the heat developed used to the best advantage. In carrying this out, the tar in the first instance is delivered under pressure by means of a pump to a coil or chamber passing through or round the supply tank, and is thereby heated to some extent. It then passes to a heater of any suitable type where its temperature is raised to such a degree as is needed to ensure the volatilization of the water and the light oil on the tar being delivered into the vapour box and its pressure allowed to fall to about that of the atmosphere. The steam thus generated and the light oils are then led to a condenser, while the tar, which is still fairly hot, is allowed to flow into a supply tank. The hot gases from the pot still may be caused to pass through or round the supply tank, so as to transfer some part of the heat which they contain to the tar therein, causing a second fraction to be distilled off, which fraction is led to a second condenser; or they may be led straight to the condenser, and in this case the additional condenser is not necessary. The tar in the supply tank is run into the pot still, where the last fractions are distilled off in the usual manner and are led to a third condenser. The residue is led off into a pitch cooler of any suitable type. By this arrangement the work done by the pot still is materially lessened, and the output per unit of plant increased and some economy of heat effected.

The necessary plant is described in conjunction with a diagram.

## APPLICATIONS FOR PATENTS.

**[Extracted from the "Official Journal" for Dec. 3.]**

Nos. 28,037 to 28,690.

AKTIEBOLAGET ARCA REGULATORER.—"Automatic control." No. 28,154.

BILLINGHAME, W. E.—"Emulsification of tar, bitumen, &c." No. 28,395.

BOYER, J. F.—"Gas-meters." No. 28,632.

BREEDEN, F. V.—"Pipe joints, &c." No. 28,190.

BRITISH ARCA REGULATORS, LTD.—See Aktiebolaget Arca Regulatorer. No. 28,154.

BURTON, A. E.—"Lids for mouthpieces of gas-retorts." No. 28,266.

COMPAGNIE POUR LA FABRICATION DES COMPTEURS ET MATÉRIEL D'USINES À GAZ.—"Fluid meter." No. 28,594.

ILLINGWORTH CARBONIZATION COMPANY, LTD., AND ILLINGWORTH, S. R.—"Carbonization of coal." No. 28,463.

ILLINGWORTH CARBONIZATION COMPANY, LTD., AND ILLINGWORTH, S. R.—"Treatment of coal and coke." No. 28,464.

JACKMAN, G. H.—"Self-lighting gas burner." No. 28,380.

JONES, F. W. SALISBURY.—"Vertical retorts." No. 28,484.

JUNG, P.—"Apparatus for ascertaining composition of gaseous mixtures." No. 28,120.

LAING, B.—"Purification of carbonaceous materials, &c." No. 28,468.

LAMONT, J. H.—"Pipe joints, &c." No. 28,593.

LOW TEMPERATURE CARBONISATION, LTD.—"Doors for closing retorts, &c." No. 28,690.

MOON, P. G. G.—See Boyer, J. F. No. 28,632.

NIELSEN, H.—See Laing, B.—No. 28,468.

PARKER, C. H.—See Jones, F. W. Salisbury. No. 28,484.

PARKER, J. F.—See Low Temperature Carbonisation, Ltd. No. 28,690.

**[Extracted from the "Official Journal" for Dec. 10.]**

Nos. 28,669 to 29,360.

CROFT, C. M.—"Inverted incandescent gas burners." No. 29,244.

FORSHAW, R.—"Gas fires." No. 29,333.

HOUSE, G.—"Device to control gas-lighting from a distance." No. 29,105.

JOHNSON, A. C.—"Remote control of street lamps." No. 28,821.

M'LAREN, E.—"Gas supply." No. 29,163.

RADIATION, LTD.—"Gas cooking apparatus." No. 29,332.

WILSON, J. L.—"Gas-fired boiler tubes." No. 29,283.

WOLLASTON, T. R.—"Gas retorts." No. 28,717.

YATES, H. J.—See Radiation, Ltd. No. 29,332.

# LEGAL INTELLIGENCE.

### Extension of Patent.

On Tuesday, Dec. 9, Mr. Justice Tomlin heard an application for the extension of letters patent granted in 1909 to Robert John Milbourne, for improvements in valves for gas purifiers. Mr. Trevor Watson said the patent would expire on Jan. 22, 1925. The patent had been exploited by the firm of C. & W. Walker & Co., Ltd., under an arrangement with the inventor, who was to be paid a royalty upon each valve according to its size. The apparatus consisted of a duplex valve which was arranged on the outside of the purifier. During the war the manufacture of the valves was seriously interfered with, owing to the difficulty of obtaining the necessary materials. His Lordship asked whether the valves were used by anyone but gas undertakings. Mr. Watson said he understood not. The sales of the valves showed that the invention had met a long-felt want. In reply to his Lordship, Mr. Dighton Pollock, who appeared for the Board of Trade, said he did not oppose a short extension. His Lordship made an order extending the patent for two years.

**Lincoln's Large Consumers.**—In the desire to meet, as far as is practicable, the wishes of large industrial consumers, of whom there is a considerable proportion in the city, the Gas Committee of the Lincoln Corporation have had under consideration the question of extending the rebate allowed, with the result that at the last meeting of the Council they presented a report recommending that the amount of 7½ p.ct., conceded to consumers of 6 million c.ft. and upwards in a year, should be increased by an additional 5 p.ct. to users of 10 million c.ft. and over. Mr. T. Kitchen moved the reference of the matter back to the Committee, contending that only very partial consideration had been given to the request which had been preferred in relation to the matter. The amendment, which was seconded by Mr. Rayment, was, however, lost; a further amendment, that the minute in regard to the Committee's decision be not confirmed, leading to the Chairman of the Committee (Alderman T. Wallis) agreeing to withdraw the report, and to take it back for further consideration.

# PARLIAMENTARY INTELLIGENCE.

## COAL CONSERVATION.

Mr. REGINALD G. CLARRY, who represents Newport (Mon.), has early in the session spoken on behalf of the gas industry. In the course of the debate on the King's Speech in the House of Commons on Tuesday of last week, Mr. Clarry made the following speech:

I desire to make some general observations upon certain omissions from His Majesty's Gracious Speech. I refer particularly to the development of industry. The matter I trust will not be controversial, as I refer more particularly to the fact of no reference to electrical development or anything connected with our coal resources or their conservation. I feel that I take an entirely disinterested view when I suggest that it is not in the best interests of an industry itself, or of the general public, that any particular industry should be made a political plank in any party platform. The difficulty is that when a Minister takes hold of an industry in this direction he generally is not able to get a correct perspective of it from its proper economic standpoint of the selling price of the commodity and of all concerned. The outlook of the politician is that he wants some grandiose scheme, far-reaching and large, which he may tell his constituents that he took some part in putting into force, and very often the vital factors that those concerned are working for are lost sight of.

The matter I particularly wish to refer to is the necessity for co-operation between the two great industries which produce light, power, and heat—an active co-operation in the public interest and in order to get the maximum economy in coal consumption. The House may remember that during the war, when we were pushed to our greatest extremity to conserve the resources of the country, two or three committees of inquiry were set up; the Coal Conservation Committee, the Nitrate Products Committee, and the Fuel Research Board among others. As a result of their work they put forward several recommendations, and part of those recommendations were put into force by the Electricity Supply Act, 1919. That dealt, however, with only a portion of their recommendations—such as could be put into operation by the Electricity Commissioners in the endeavour to co-ordinate the electricity supply of the country to prevent any wastage of coal. Another very important recommendation, really more in the spirit than in the words, was the necessity to conserve our coal resources. Coal is a national asset and an asset that is wasting, and anything that can be done to prolong the life of our coal resources should receive the active support of every member of this House, without distinction of party.

The production of 95 p.ct. of the electricity in this country necessitates the consumption of coal under boilers for producing steam. In the sister industry, the gas industry, coal is carbonized under different conditions, and brings about different results. One ton of coal produces, approximately, 10,500 c.ft. of gas, 11 cwt. of coke, and 10 gallons of tar. Tar, we all know, is utilized for road spraying, and in addition there are upward of 100,000—in fact, there is no limit to the number—derivatives, from coal tar. We also get from that ton of coal a quantity of ammonia which is very valuable to this country. The suggestion I wish to make now, and I hope to go into it in more technical detail at some future time, is that the right way to deal with this matter to meet the case of coal conservation and electrical development is through active co-ordination between the two great sister industries of lighting and power—namely, the gas and electrical industries. Sufficient can be said to make out a case for inquiry on the subject. Coal is an asset which must be conserved in every direction. A suspicion and prejudice has grown up between the two industries; it is difficult to say how or why, but it is admitted on all hands. It is admitted in the fourth annual report of the Electricity Commission; they admit difficulties in that direction; and they would also prefer further powers to put into operation the findings of the different committees that have been set up. I am submitting merely a few general observations at this moment, because I understand this is one of the few opportunities one has for dealing with general business during the debate on the Address, and I desire to say no more now.

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**Southampton Gas Company Development.**—By 88 votes to 16 a parish meeting held in the New Forest Hall, Lyndhurst, approved a scheme authorizing the Parish Council to proceed with the lighting of the village by gas. Mr. J. R. H. Jacobs (Secretary and General Manager of the Southampton Gas Company) informed the meeting that his Company proposed to extend their mains in certain directions to meet the requirements of the scheme, and they were willing to spread the initial cost of providing and fixing the lamps over a period of years. Under the project it is contemplated fixing 28 lamps (columns for which already exist) at most of the dangerous places. The sum of £217 (to be spread over three years) will cover the cost of the lamps and their erection, and the Council have sanction to spend £125 for the first year to cover capital outlay, gas, maintenance, &c.

**Power Gas Corporation.**—The annual report of the Power Gas Corporation, of Stockton-on-Tees, stated that the generally adverse conditions of trade, which unfortunately still prevailed, had been reflected in the results of the trading during the year. A substantial volume of orders had, however, been obtained, particularly during the latter part of the year. The financing of these orders, coupled with the settlement of liabilities for taxation, make it advisable that the Company's resources should be conserved; and the Directors therefore recommend that, subject to certain appropriations, the balance to the credit of profit and loss account should be carried forward. The accounts show a profit of £12,197, to which has to be added £11,070 brought forward from the previous year. Out of this amount the Directors have appropriated £2000 to the reserve fund; and the balance carried forward is £21,267.

# MISCELLANEOUS NEWS.

## GAS REGULATION ACT APPLICATIONS.

There have appeared in the "London Gazette" the following further notices regarding applications to the Board of Trade under the Gas Regulation Act.

### AMENDING ORDER.

**Tottenham District Light, Heat, and Power Company.**

[Application by the Middlesex County Council.]

The Board of Trade give notice that the Middlesex County Council have made application under sub-section (3) of section 1 of the Act for an amending Order revising the powers of charging authorized by the Tottenham Gas (Charges) Order, 1921, by reducing the standard price prescribed by that Order.

Any person affected desiring to make representations with regard to the application may do so by letter addressed to the Director of Gas Administration, Board of Trade, Great George Street, London, S.W. 1, not later than Dec. 24.

A copy of such representations must at the same time be sent to the Middlesex County Council and to the Tottenham District Light, Heat, and Power Company.

### SPECIAL ORDER.

**Leigh (Lancs.) Corporation.**

Application is to be made by the Leigh Corporation to the Board of Trade for a Special Order, to extend their limits of supply by the addition of the township and parish of Culcheth, to enable them to purchase further land, to provide for the adoption of the thermal basis of charge (with a maximum of 18d. per therm throughout the existing limits of supply), and to confer upon them further powers with regard to the gas undertaking.

## GAS REGULATION ACT ORDERS.

We have received from the Director of Gas Administration a copy of the following further Order made by the Board of Trade under section 1 of the Gas Regulation Act.

**Guisborough Gas Company, Ltd.**

After the declared date, the maximum price in respect of gas supplied by the undertakers shall be 14'4d. per therm. (Dec. 11.)

## NEW CARBONIZING PLANT AT PADIHAM.

The completion of an installation of new carbonizing plant at the Padiham District Council Gas-Works was celebrated last week-end, when a party were conducted over the works by the Engineer (Mr. A. F. Ames). The new retorts, which have been installed by Messrs. Drakes', Ltd., of Halifax, are of the horizontal type, and are expected to effect considerable economies in the cost of gas-making.

After the inspection, dinner was served in the Starkie Arms Hotel. Among those present were Alderman H. Emmott, J.P., and Mr. J. H. Clegg (Chairman and Engineer respectively of the Burnley Corporation Gas Department), and the Chairman of the Oswaldtwistle Gas Committee. Alderman Emmott, in proposing the toast of "The Padiham Gas Department," congratulated the town on its fine gas-works. He had seen the plant, and considered it a credit to the Gas Committee. Burnley were embarking on the construction of new works, and they had had to consider what system of carbonization they would adopt. Like Padiham, they had decided in favour of horizontal retorts. Councillor E. Wiggins (the Chairman of the Padiham Gas Committee) responded. He said they had hitherto had two systems working together, and this was expensive. To secure economical working, they had to have one system, and they accepted Messrs. Drakes' tender for horizontals. They had so much confidence in the firm, and their system was so simple and acceptable, that he thought they would have obtained the contract even if their price had been a little higher than anyone else's. In the last year the cost of manufacture of gas was 1s. 6d. per 1000 c.ft.; but with the new plant they expected it to be 11d. Any increased consumption would be met without additional cost of labour, and the plant could be extended without requiring much extra staff to work it. During the last five years a new holder had been installed and 8 miles of mains and services had been re-laid. The gas consumption had increased from 77 to 118 million c.ft. The net profits in that time had been £11,620.

Councillor Coe proposed "The Contractors," and said the plant would undoubtedly add to their already high reputation. Mr. Thompson replied on behalf of the firm.

Councillor Coe spoke in high terms of Mr. Ames, who is shortly leaving for Oswaldtwistle. Mr. Ames said he had attached great importance to bringing-down the capital charges, and he considered Padiham was now on the way to a cheap and good supply of gas.

Dr. Mackenzie (the Chairman of the Council) proposed "The Visitors," which was responded to by Councillor F. Greenwood, of Oswaldtwistle, and Mr. Clegg, of Burnley.

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**Macclesfield Gas Accounts.**—The gas-works accounts for the year ended March 31 show a gross profit of £6085. By payment of various loan charges, this sum is reduced to a net profit of £1928. Sales of gas amounted to £47,005, and residuals brought in £11,514. The sales of gas through prepayment meters accounted for more revenue than the sales through ordinary meters.

## CONTINENTAL UNION GAS COMPANY, LTD.

The Ordinary General Meeting of the Company was held on Tuesday, Dec. 9, 1924, at Winchester House, Old Broad Street, E.C.—Colonel H. LEROY-LEWIS, C.B., C.M.G., D.S.O., in the chair.

The SECRETARY (Mr. Arthur Nops) read the notice convening the meeting and the Auditors' report; and the report of the Directors and the statement of accounts were taken as read.

### CHANGES IN PERSONNEL.

The CHAIRMAN: Ladies and Gentlemen,—Before proceeding with the business of the meeting, I should like to refer to the great loss the Company has sustained during the year in the death of Mr. A. F. Phillips, which occurred on March 31. Mr. Phillips had been a Director of the Company for 19 years. His wide experience of gas companies, and his vast technical knowledge, were constantly of the greatest value in our deliberations, and his death came as a great blow, not only to our Company, but to the gas industry in general. Mr. Phillips was a man of great personal charm and geniality, and endeared himself to all who came into contact with him. I feel sure you would like me to convey to the family of Mr. Phillips the heartfelt sympathy of the stockholders of this Company. ["Hear, hear."] Your Directors nominated Mr. S. H. LeRoy-Lewis to fill the vacancy on the Board. The death also occurred during the year of Mr. E. C. Bode, the Secretary, who had been for 48 years with the Company. He devoted his whole life to the interests of the stockholders, and few companies have enjoyed such whole-hearted and faithful service. He has been succeeded by Mr Arthur Nops, who has occupied the post of Accountant for many years with conspicuous ability.

### THE SIXTIETH ANNUAL MEETING.

You will notice that you have now been summoned to the sixtieth annual general meeting of the Company, and in this year of our "Diamond Jubilee" it may be of interest—especially to those who have only recently become stockholders—if I make a brief reference to the history of our Company. The Company was incorporated, under the Chairmanship of Mr. Lewis Cubitt, on April 18, 1864, with a capital of £400,000. The immediate object was to come to the rescue of a French Company which was in such financial straits that it was unable to continue working certain concessions for the supply of gas that had been granted to it. The English Company immediately took control, with such good effect that a dividend of 8 p.ct. was distributed in August of that same year—a rate which was maintained for some years. Meanwhile the works of Montargis had been purchased for £7000 at public auction, and the works of Messina for £55,000. Both of these stations were worked, you will remember, as Continental Union stations, and not as belonging to the French Company. In November, 1865, 10,000 £20 preference shares were created and distributed to the stockholders in the proportion of one new share for every two shares held. The ordinary share capital was increased in July, 1869, by the issue of 10,000 £20 shares, and in July, 1872, by the issue of a further 10,000 £20 shares. The total issued capital had thus reached the figure at which it now stands. The shares were converted into stock in June, 1891. In 1874 the French Company—hitherto a Société en Commandite—was re-constructed and converted into a limited liability company. Thereafter our Company, instead of directly managing the affairs of the French Société en Commandite, became a shareholder of the re-constructed Union des Gaz, holding a substantial amount of its shares. The dividend distributed by our Company, which had in 1876 fallen to 6 p.ct., owing to the increased amount of capital, began to rise steadily, until in 1888 it reached its peak of 13 p.ct. (meaning also an extra 3 p.ct. to the preference shareholders), which rate was maintained until 1896, when a decline set in. By 1902 it was reduced to 8 p.ct., and by 1910 to 4 p.ct., the rate which was paid in 1914. From that date onwards I do not think it is necessary to make any detailed reference to our dividend-paying achievements. In 1908 we transferred our Montargis works to the Union des Gaz, and in December of that same year our Messina works were engulfed in the catastrophic earthquake which took place. Since then we have had no gas-works of our own.

### THE PROFIT AND LOSS ACCOUNT.

I now beg leave to move that the report and accounts be received and adopted, and in doing so I shall first invite your attention to the details of our own activities, as revealed in the profit and loss account and balance-sheet, and later I shall refer briefly to the affairs of the Union des Gaz, with which Company we are, as you know, so closely bound up. Turning to our profit and loss account, you will see that management and general charges are slightly more than last year; but the smallness of the increase does not call for a detailed analysis. The provision for taxes—income-tax on such of our revenue as has not suffered deduction at source—has advanced from £2800 to £3000. This, though an increased debit to our profit and loss account, is an excellent sign, as it indicates an increased distribution of dividend by the Union des Gaz. In the next item, exchange reserve, the annual appropriation has been increased from £3000 to £6000. This was considered a prudent move, as our hopes in regard to the French exchange—which is such a vital matter for us—still remain unfulfilled, and the prospects of a return of the franc to anything approaching its pre-war parity are, unfortunately, as remote as ever. On the credit side of the profit and loss account it will be noticed that the dividend paid last January on the preference stock absorbed £10,587 10s. of our available balance of £11,835 16s. 3d., leaving a sum of £1248 6s. 3d. to be carried forward. Dividends and interest received during the year show an increase from £18,663 to £23,058. This is accounted for principally by the increase from 3 to 5 p.ct. in the dividend paid by the Union des Gaz. The amount of income-tax refund on management expenses has fallen somewhat, due to the fact that the refund was at the rate of 4s. 6d. in the pound as against 5s. in the previous year. Sundry receipts, consisting mainly of transfer fees, show an advance from £31 to £38, indicating a somewhat greater activity in our stock. There remains a balance of £12,890 15s. 4d. to the credit of profit and loss account, which is £1055 better than last year. Out of this balance there was distributed in July last an interim dividend of 3½ p.ct. on the preference stock; and the Board propose paying a further 3½ p.ct. in January next, making 7 p.ct. for the year. This, you will remember, is the full amount to which the preference stockholders are entitled before a dividend can be paid on the ordinary stock. This dividend will absorb £10,850, leaving £2040 15s. 4d. to be carried forward. Your Directors greatly regret that they are unable to recommend any distribution yet on the ordinary stock. We are gradually strengthening our position, and it is greatly hoped that the day for resuming payment of ordinary dividends is not far distant. What we must all hope and pray for is a steady and sustained improvement in the French exchange.

### EXCHANGE.

While I am on the subject of the exchange, those of you who have attended these annual meetings regularly in past years will remember that we have been in the habit of exhibiting a chart showing, in different colours for each year, the fluctuations in the French exchange. It has been found scarcely practicable to keep this up, as during 1923-4 the fluctuations were so violent—especially in March, when the franc touched 120 to the pound—that last year's curve would, on the same scale, reach somewhere up into the room above our heads. On June 30 the exchange had dropped to the comparatively reasonable figure of 82. It has remained ever since somewhere in the eighties. This is quite a disastrous figure for all who invested in the franc at par, but I think it a good sign that the violent fluctuations of the early part of this year have come to an end.

### THE BALANCE-SHEET.

If you will now turn to the balance-sheet, you will notice a considerable increase, from £12,308 to £23,666, in the amount of sundry creditors and credit balances. This is accounted for, first, by the addition of £6000 to exchange reserve, as shown in the profit and loss account; and secondly, by the profit on the book value of certain of our investments which it was thought advisable to realize. We had on our books last year a number of investments in small provincial gas companies in England. These were very good investments of their kind, and gave a nice yield, but they were not quoted on the Stock Exchange, and were not freely marketable. It was therefore considered that this was not an ideal class of investment for such a concern as ours, and we have managed to dispose of some of them at a figure which considerably exceeded their value on our books. You may remember that we wrote them down to their market value on June 30, 1921. The surplus now figures among our credit balances as a reserve against the depreciation of our foreign securities; or, I should say more accurately, against the depreciation of the franc. The actual market value, in francs, of the Union des Gaz shares, which form the substantial portion of our foreign holding, is actually a good deal higher than the price at which the shares figure on our books, but here, again, the old bogey of exchange crops up, as in the matter of the dividends received from these investments. This now brings me to the credit side of our balance-sheet. Apart from our foreign investments, to which I have just referred, the book value of our English gas and general investments fully represents your capital, and even a considerable appreciation is shown. The total amount of our investments has slightly increased, and the proportion of gas investments to general investments has undergone a slight change. The explanation of this I have already given, in the sale of our shares in small English gas companies. The proceeds of these sales have been re-invested in sound marketable securities. Cash at bankers, loans, &c., show an increase. Our banking account was on June 30 temporarily swollen preparatory to the distribution of the interim dividend on July 3. The sundry debtors show an increase due to the fact that our friends the Union des Gaz owed us some £1600 at the end of the year. I think now, ladies and gentlemen, that I have accounted for all the figures on our profit and loss account and balance-sheet.

### AFFAIRS OF THE UNION DES GAZ.

Let us now turn to a brief consideration of the affairs of the Union des Gaz, in which a large proportion of our capital is sunk. That Company, like all other public utility companies, experienced a disastrous time during the war, and for the few years following, manacled as they were by the terms of their contracts, which were drawn-up on a pre-war basis. As you may know, the price of gas was fixed then at a definite figure by a contract between the municipal authorities and the company supplying the gas. A continuance of operations on these lines was manifestly impossible—collapse and bankruptcy would be the inevitable result. Accordingly, when the price of raw material—in our case, coals and labour—started soaring, provisional arrangements were made by which the companies were enabled to carry on. Such arrangements, however, were not sufficiently generous to enable normal profits to be made; but they avoided the necessity of closing-down the works, and left the question of definite revisions of contracts until the general condition of affairs began to settle down. Gradually, as it became evident that there was no prospect of prices falling to their pre-war level, negotiations were begun with the object of stabilizing the conditions under which companies were to operate. Eventually a system was devised whereby gas companies are enabled to operate with the assurance of an equitable return on the capital employed, without being at the mercy of a sudden rise in the cost of coal or labour, or, on the other hand, having the opportunity of making excessive profits at the expense of the consumer in case these primary costs fall. Experts were nominated by the companies and the representatives of the consumers. These experts made detailed and lengthy examinations of our accounts over a period of years, analyzed all our receipts and expenditure, and finally, as a result of their labours evolved a formula which would give an equitable figure for the price

to be charged for gas, based upon the cost of coal, the cost of labour and overhead charges, and on the revenue from bye-products. Fixed coefficients were applied to each of these items, in proportion to their importance as elements in the cost of the gas, so that any fluctuations in one of the component items would be reflected in the resultant price to be charged to the consumers. In most of the stations of the Union des Gaz these new formulæ are in operation; but in one or two instances the experts are still sitting. New contracts have been signed with the town authorities embodying these formulæ; the terms vary slightly in different regions. The effect of the adoption of these new contracts can be seen in the progressive prosperity of the Union des Gaz. That Company was able—for the first time since 1914—to declare a dividend for the year 1921-2 of 15 frs. per share (or 3 p.ct.); and for 1922-3 25 frs. (or 5 p.ct.) was paid. For 1923-4 an interim dividend of 15 frs. (3 p.ct.) has already been distributed, and I feel very confident that the final dividend to be declared will show an advance on the figure of 1922-3. It would not be unreasonable to suppose that this increased price of gas, which has restored a certain measure of material prosperity to the Union des Gaz, might act as a check on the sales, especially in France, where the inhabitants are by instinct more thrifty and economical perhaps than those of any other nation. Such, however, is not the case. The gas sold in the various works amounted in 1923-4 to 34 million cub.m. (say, 1200 million c.ft.), as against 31 million cub.m. in 1922-3—an increase of 10 p.ct.—and 28¼ million cub.m., in those same works, in 1913-14, when the price of gas was from one-third to one-quarter of what it now is. The number of gas consumers on June 30, 1924, was 77,657, as against 75,224 in 1923, and 66,082 in those same works in 1914. This goes to prove, I think, that the Union des Gaz is a really progressive Company. Far from being discouraged by the deplorable negative results of their efforts to keep matters going during the war period, the administration appears to have resumed their normal activities with added zest after their years of labour devoted mainly to keeping their heads above water. Although no mention is made of electricity in the title, this commodity is playing an increasingly important part in the activities of the Company. In 1913-14 the Company had 2300 consumers of electricity; on June 30, 1923, there were no less than 15,700; and at June 30 last, this had increased to almost 19,000. The general impression is that gas and electricity are, or should be, natural rivals; but at the four stations where the Union des Gaz has the contract for the supply of both, the two walk admirably hand in hand.

### LABOUR SITUATION IN FRANCE.

One advantage which the Union des Gaz enjoys is that its interests are widely spread throughout France. It has stations in seaports, in market towns, in the wine-growing district, in the industrial midlands, and in a very large district just outside Paris. This district includes a highly concentrated industrial area and a number of Communes which are developing very rapidly as residential suburbs—as dormitories for thousands of Paris workers. There might occur periods of depression in the fruit and wine growing departments, in the Mediterranean ports, or in the industrial North or Midlands, but these periods would not necessarily coincide. At present, of course, there is no suggestion of depression in any of these. France recently published a statement of her total number of unemployed. The figure was between 400 and 500. In some of its works the Union des Gaz is experiencing real difficulty in finding the necessary labour; in others, the retort-house squads are still partly composed of African natives, who were imported as emergency workers during the war, when all able-bodied Frenchmen were with the Colours. There has been no white labour available to replace these Africans, and so they remain.

### POLICY OF THE BOARD.

I have endeavoured to give you an insight into the condition of the Continental Union and the Union des Gaz and I think that you will agree with me when I state that the affairs of both Companies are not unsound. The fact, however, remains that the Continental Union is paying no dividend on its ordinary stock, which cannot be regarded as satisfactory. The reason for this is not difficult to explain, and may be summed-up by stating that the depreciated exchange of the franc is the sole cause for this regrettable omission. The Union des Gaz paid for last year a dividend of 5 p.ct., and were the franc at gold parity we should have been able to pay you a dividend on the Continental Union ordinary stock of 5 p.ct.; but unfortunately the franc is depreciated, and we are therefore unable to do so. The policy which your Board are pursuing is that of slowly, and we hope surely, consolidating our position. At the end of the war our condition was distinctly bad, and that of the Union des Gaz even worse; now the Continental Union is gradually recovering. We began by paying small dividends on our preference stock, increasing these until we can now look upon that dividend as fairly well assured. On the other hand, the Union des Gaz is in a flourishing condition, so that the omens are not unfavourable; but I do not wish to raise hopes that may not be capable of realization. All that I can trust you will do is to believe that your Board are pursuing a sound and conservative policy, and that we shall do our utmost to give the ordinary stockholders some return upon their investment.

### THE OUTLOOK.

It has been my custom for the last four years to go somewhat minutely into the state of France, so as to justify the view, which I still hold, that the future is not as black as it is painted by some authorities. I do not propose this year to inflict upon you a burden of statistics, or to deal too minutely with this question, partly because an excellent work exists already, which will satisfy the curiosity of students of such problems—namely, the "Report on the Economic Conditions in France," revised to June, 1924, by Mr. J. R. Cahill, the Commercial Counsellor of His Majesty's Embassy in Paris—and partly because I have noticed that, no sooner has my comforting message, addressed to the stockholders of the Continental Union, gone forth, than almost immediately a sensational fall in the French exchange takes place. So I am not going to risk the utterance of any unduly optimistic sentiments, but I shall venture to quote one paragraph of Mr. Cahill's excellent report, which deals with the present position of the French public finances:

> "The position, which was viewed with great anxiety in the early months of the year, appears now to be regarded with far greater composure; and it can hardly be doubted that, as a result of the energetic fiscal measures recently adopted, of the notable re-birth of general confidence, and of the persistence of the extremely prosperous economic condition of the country, the public finances, which have already traversed their worst period, and which may perhaps be aided by substantial reparation payments, will tide successfully over the remaining period of trial. . . .
>
> "It would be idle to speculate as to the future course of the external value of the franc, in view of the many factors that contribute to its formation. General European experience in the last few years has shown that the first essential to the preservation of the due foreign value of a national currency is the maintenance of a real equilibrium of the State expenditure and revenue; and France has recently adopted measures towards ensuring this equilibrium. In her case, the French Parliament have voted the important measure of fiscal reform, which has as its essential features progress towards the establishment of a single State Budget by the transfer of the permanent charges of the (Separate) Reparations Budget to the General Budget, the provision out of revenue of about six milliards thus transferred, the commencement of the abandonment of the loan policy, severe retrenchment in the public services, and more penetrating and efficient methods of tax collection. Its external value will accordingly be strongly influenced in the first place by the actual results achieved by these fiscal reforms, by the maintenance of the undertaking not to introduce new expenditure without providing new resources, and by the proportion of the actual floating debt that may remain unfunded; and, in the second place, by the magnitude of the visible and invisible trade balances. These balances will automatically reflect the extent of the recovery of French agriculture and industry, as well as the measure of the compliance of Germany with her financial obligations arising out of the Treaty of Versailles. Its course will, no doubt, be duly sensitive to any arrangements respecting inter-allied indebtedness (which has not hitherto weighed on the franc, owing to the absence of specific demands for repayment), as it will be sensitive, to a more or less degree, in accordance with the thoroughness of the purification of the public finances, to the usual happenings of moment in the political and economic spheres.
>
> "The positive factors that should tell in favour of a not too remote recovery are many. With the maintenance of peace France should rapidly regain, and indeed considerably surpass, her former productivity, as a result both of the reconstruction of the devastated areas and of the improvements as regards equipment, magnitude of units, and organization in the coal, mining, metallurgical, engineering, textile, and other industries therein, and of the general improvement in the manufacturing power of other areas. Alsace and Lorraine have also given her new resources in raw materials, ores, potash, and oil, as well as several highly developed industries. Her general improvement in the railway, canal, and port systems has been considerably advanced, if not completed, as in the case of the railways. Her agriculture is fast regaining its strength. The weight of unduly large imports on the franc will therefore tend to diminish with her increased productivity in industry and agriculture.
>
> "French finances have now traversed their worst period. The principal element of disturbance since 1919 has been the financing of the war damage settlements, but, as 56 milliards out of the total estimate of 82 milliards due had been paid by the end of April, 1924, the yearly disbursements are bound to dwindle as regards compensation for damages both to persons and property. The payments to persons are already showing decreases by large amounts (*e.g.*, credits of 3.2 milliards granted for 1923 were reduced by 400 million frs. for 1924, and by the year 1930 are expected to be only 2 milliards); and pensions, disability compensation, annuity payments in settlement, and other charges, will show, as years pass, great automatic reductions. Many items of expenditure have shown also remarkable shrinkage, or have been suppressed, and the general retrenchment scheme affecting the administrative service will doubtless lead to considerable reductions in claims on the public purse. This reduction in expenditure appears destined to be accompanied by a considerable expansion in revenue, so that, granted fairly normal developments, the primary causes of the depreciation of the French franc—undue expansion of the fiduciary currency, and the far greater indirect inflation by the unbroken policy of loans or issues of various kinds under State guarantee—should gradually cease to produce their inevitably pernicious effects, and, as gradually, the franc should recover its gold value by the removal of the factors most directly ministering to its present disease."

I have quoted at full length the conclusions come to by one who is well qualified to form a correct opinion on the difficult problem of French finance, and I am somewhat emboldened to hold the views expressed to you in my former addresses by the approbation of such a high authority. There are some persons who hold that the policy of the French Government is further to depreciate the value of the franc, so that the burden of her internal debt may be lightened—in fact, to resort to the policy of fraudulent bankruptcy, so successfully pursued by the German Government. But my long and intimate knowledge of France and the French character makes me doubt the

accuracy of such a forecast: on the contrary, I feel sure that the present difficult situation will be surmounted by the traditional honesty, bravery, and statesmanship of the French Government and people.

The DEPUTY-CHAIRMAN (Sir George Touche, Bart.) said he had great pleasure in seconding the resolution, and, in doing so, felt that he could not usefully add anything to the admirable and eloquent remarks of the Chairman on the past history of the Company and the present conditions. He had observed that the Chairman displayed due caution in speaking about the future of the franc, but in other respects he thought they would find his indications of their prospects distinctly encouraging.

Mr. R. M. LONG said the Chairman had made some reference to investments, and in view of there being no dividend on the ordinary stock the proprietors would be glad to know whether the figure of about £1,000,000 at which these investments appeared represented their value to-day. Then he saw that a new Director had been appointed. Virtually they were now merely a Trust Company holding securities, and they had already a very capable Board. Was it necessary under the Articles of Association to have so many Directors, because, of course, every possible economy ought to be exercised while the ordinary stockholders were not getting any dividend?

Mr. W. J. STEVENS remarked that the general investments figured at £168,000; and, in view of the fact that their principal string seemed to be rather a bad one, they were hoping that this second string might prove very useful to the ordinary stockholders. Could the Chairman indicate in general terms what these investments consisted of, so that one might judge whether they would be likely to help them out of the difficulties in which their main investments had landed them—not through any fault of the Board.

The CHAIRMAN replied that the nature of the investments represented by the £168,000 was so very general that it would be absolutely impossible to go into detail. The investments were spread over an extremely wide field. The Directors had adopted the policy which trust companies usually applied, of trying to average their investments, and they were in this way enormously aided by the presence on the Board of Sir George Touche, whose knowledge of trust company finance was second to that of nobody. They had been extremely successful, and the appreciation which was shown by these investments was very considerable indeed. This side of the business was therefore all right. So far as the Union des Gaz side of the matter was concerned, the depreciation was very substantial, and this naturally gave the Directors a great deal of anxiety, but it was a matter regarding which they were really "in the lap of the gods." It would be impossible to realize their large holding, except at a disastrous sacrifice; and so long as the Union des Gaz itself progressed satisfactorily, and there was some prospect—as the highest authorities believed there was—of the franc recovering somewhat, he thought the proprietors might rest fairly well assured that the future was not too bad. With regard to the number of Directors, he entirely agreed with what had been said—though the amount taken by the Board was only £1500—and if it were possible to reduce this number, he would be in favour of such a step. The reason, however, for the number of Directors being maintained was allied to the Union des Gaz. The Continental Union Company were obliged by the Articles of the Union des Gaz to have a certain proportion of Directors on their Board, and this proportion was six. Therefore they must keep up to that number. It was, in fact, very desirable that they should have this representation.

The resolution for the adoption of the report and accounts was then put to the meeting and carried unanimously.

### RE-ELECTION OF DIRECTORS AND AUDITORS.

Proposed by the CHAIRMAN, and seconded by Sir JAMES F. REMNANT, Bart., M.P., the retiring Directors (Sir George Alexander Touche, Bart., and the Rt. Hon. Lord Wargrave, P.C.) were re-elected, and the appointment of Mr. Stuyvesant Henry LeRoy-Lewis to fill the vacancy on the Board caused by the death of Mr. A. F. Phillips was confirmed.

The Auditors (Mr. C. P. Crookenden, F.C.A., and Mr. G. A. Cave-Orme) were re-appointed, on the motion of Mr. LONG, seconded by Mr. W. BENNETT.

### VOTES OF THANKS.

The CHAIRMAN remarked that only one more duty remained to him, and it was a pleasant one—namely, to propose that the thanks of the meeting be accorded to the staff at home and abroad for their services during the past year. As he had already mentioned, the Company had suffered a serious loss by the death of the late Secretary; but fortunately in Mr. Nops they had a very worthy man to replace him, as well as an excellent Assistant Secretary in Mr. Swanson. The small staff at Drapers' Gardens worked with great enthusiasm and much energy.

The DEPUTY-CHAIRMAN seconded the vote, which was acknowledged by Mr. NOPS on behalf of the staff.

Proposed by Mr. W. J. LIBERTY, and seconded by Mr. STEVENS, a hearty vote of thanks was passed to the Chairman and Directors for their services.

The CHAIRMAN's response brought the proceedings to a close.

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The path of the Truro Corporation electric lighting project is a thorny one. The scheme prepared by the Council's expert has not met with favour by many of the councillors who are not on the Lighting Committee and by a large number of ratepayers. A report on the scheme has been prepared, and the Council have decided to send this to the Electricity Commissioners. One of the members suggested that they should wash their hands of the scheme, which was not satisfactory to the Commissioners, was not approved by the second expert or the Council, and was not wanted by the ratepayers.

## SOUTH BARRACAS (BUENOS AYRES) GAS AND COKE COMPANY, LTD.

The report adopted at last Monday's meeting of the Company (held at the London Offices, No. 287, Dashwood House, New Broad Street, E.C.), which has already been briefly referred to in the "JOURNAL," was to the effect that the debit balance brought forward from the previous accounts amounted to £167,798, and that after charging interest the debit balance of revenue account at the end of 1923 was £14,178, making a total debit of £181,976. During the period under review (1923), the Primitiva Gas Company of Buenos Ayres continued to supply all the gas required by the South Barracas Company, in accordance with the working agreement between the two Companies. The amount of gas sold during 1923 was 818,437 cub.m., which compares with 508,034 cub.m. during 1922. This increase was mainly due to the supply having been re-established in districts where it had been discontinued. The sales of assets and the settlements with creditors, mentioned in previous reports, continue to be dealt with as opportunity offers. The sales of properties have resulted in a loss. At Dec. 31, 1922, prior lien debenture stock was outstanding to the extent of £20,576. Of this amount £16,315 represents collateral security, the balance having been issued in respect of cash advances made to the Company. No debenture interest has been paid since the date of the last report.

The CHAIRMAN (Mr. F. C. im Thurn), after making feeling references to the death on June 27 last of Mr. A. M. im Thurn (who had been connected with the Company for very many years, and had been a Director since 1910) and to the appointment of Mr. R. F. im Thurn to succeed him on the Board, went on to say it was quite evident, from the balance-sheet before them, that sooner or later a re-construction of the Company must take place, because they could never hope to wipe-off the heavy debit which had accumulated, pay the interest on the debenture stocks and loans and advances, and still have something left for the shareholders. They could, however, reconstruct without the permission of the Primitiva Company, and were not thinking of taking any such step at present, because for various reasons the time was not suitable; but he thought it right again to place on record his opinion that, when the reconstruction was taken in hand, there could be nothing for the shareholders. This expression of opinion was only made after a full consideration of all the facts. The primary reason for the meeting was to comply with the Companies Acts; but he would proceed to deal with the working for the period under review. Turning to the revenue account, and comparing it with that for the previous year, the main items calling for comment were in connection with gas supplied by the Primitiva Company and gas sales. The increase in the item "Cost of gas supplied by the Primitiva Company" was due to the larger quantity of gas taken from them; while the receipts from the sales of gas had increased in a greater proportion because, when compared with 1922, the margin between the price per cubic metre charged by the Primitiva Company and the price paid by the public was slightly greater. Management in South Barracas showed an increase of £1561; but this difference was mainly due to interest and management charges paid to the Primitiva Company, less extraordinary expenses which figured in the previous accounts, and which did not appear on the present occasion. Taking the revenue account as a whole, the shareholders would see that, after charging London Office expenses amounting to £106, there was a working loss of £711. To this had been added interest charges amounting to £13,466, thereby making the total loss £14,177. The balance-sheet itself was much the same as it was at December, 1922, except that unpaid interest had been added to the loans and advances on the liabilities side, while on the assets side there was a small reduction in the property account, due to sales which had been effected in order to settle with local creditors in accordance with authority given by the two classes of debenture stockholders in 1920.

In replying to a question as to whether the Company might not just as well shut-down at once, the Chairman repeated that, much as they might like to do so, they could not take any steps at the present time. The matter was not altogether hopeless for the debenture holders. The district was a very fine one.

The report and accounts were adopted, and the retiring Director (Mr. R. F. im Thurn) and the Auditors (Messrs. Arthur Goddard & Co.) were re-elected.

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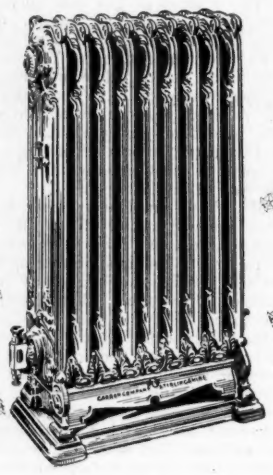
**All-Night Lighting.**—The Torquay Corporation have referred to the Highways Committee for consideration and report a letter from the Torquay Trades and Labour Council, asking the Corporation to consider the necessity of maintaining a modified or partial system of lighting the roads of the borough during the night. At a meeting of the Lighting Committee of the Sleaford Urban District Council a letter was read from the Sleaford Tradesmen's Association suggesting to the Council the advisability of keeping a number of street lamps lighted throughout the night. The Committee carefully considered the matter; but in view of the extra expense which would be incurred, it was resolved to recommend to the Council that it would not be desirable to alter the existing arrangements at the present time.

**Utilization of Household Rubbish.**—In the administrative County of London, serving a population of 6,000,000, the production of household rubbish is 1,500,000 tons per annum. Over 1,200,000 tons is thrown away in London, either into the sea, on the mudflats of the Thames estuary, or in tips in the outlying districts. This is done at an average cost of no less than 6s. per ton. Household refuge, when sorted from the more valuable material such as bottles, tins, rags, and paper, gives a residual which, with scientific methods of combustion, will evaporate about 1 to 1½ lbs. of water per lb. of material—equivalent to one-fifth to one-sixth the value of coal. Great economy could be obtained by burning all household refuse under steam boilers. The problem is not an easy one; but it will be solved as soon as the importance of the matter is realized.

By Appointment.



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## NORTH-EAST COAST COAL TRADE.

**From our Own Correspondent.**

The past week has been quite a good one, and many collieries now have a full time for the rest of the year. Some trouble was occasioned by the fog, and the consequent late arrival of boats. But the position has opened out again, and arrivals of tonnage are quite satisfactory.

There has been good all-round inquiry for Durham coals for early shipment; but very little development in contract business for next year, in which the position remains very uncertain. Unscreened bunkers have been a good market, up to 20s. f.o.b. for best sorts, and there has been much inquiry for coking makes, which have been quoted up to 19s. 6d. for unscreened and 18s. for smalls.

Gas makes have continued in good request, and firm at recent prices. Wear specials quote 22s. to 22s. 6d. f.o.b., and best qualities 21s. 6d. Seconds are 18s. to 18s. 6d.

In view of the curtailment of production next week, due to the Christmas holidays, there is not likely to be much coal available for the market for the rest of the month. Some collieries have good bookings already into January.

## COAL TRADE IN THE MIDLANDS.

**From our Local Correspondent.**

Nothing has occurred to give any real stimulus to business. With the approach of Christmas household coals are being called for on a somewhat larger scale; but even in this branch the late apathetic tone of the market has not been dispelled. Values generally are no more than upheld. If there is any improvement in the industrial demand, it is barely discernible. With pits mostly working a day short of the full week, and supplies easily keeping pace with demand, consumers are not anxious about strengthening reserves against forward requirements. The holiday intermission is likely to reduce output beyond the normal, but this prospect causes no disquiet. Fogs, and breakdowns on the railways arising from fogs, have accentuated traffic delays. In the present state of the trade consumers give themselves little trouble on that score, but it aggravates the difficulties of some of the collieries, as well as the distributive branches. The increased activity in the main market has not been maintained. It has lacked the support of consumptive demand. There are better hopes for the coming year, and though negotiations for additional fuel supplies are in the tentative stage the probability is that more blast-furnaces will be blown in. Nobody expects much development before the end of January. Furnace coke remains firmer. A feature of the market is the increased demand for D.S. nuts. Slacks are not being taken up quite so fast as they are produced. The gas coal trade shows the seasonal development, but no more.

## YORKSHIRE AND LANCASHIRE COAL TRADE.

**From our Local Correspondent.**

Gas coals in Yorkshire and Lancashire are, owing to the darker weather, in better demand, but, outside contract deliveries, there appears to be nothing of moment available. Prices, therefore, remain steady, with indications of lower than contract figures for immediate "spot" sales.

The continuance of mild weather operates against an increased demand for household fuel, which is still moving slowly. Several collieries are reported to have accumulated small stocks—a most unusual thing for this period of the year. It is probably accounted for by the lack of export business, which in normal times takes a certain percentage of large coal.

The anticipated increase of business in the industrial section has not materialized, and saner thoughts lead one to expect that it will be some time before there is any apparent improvement in consumption, although many collieries have been inclined to advance their prices for the better grade fuels. So far no new business of any consequence has been put on the market. Gas and furnace cokes are weak, particularly the former.

The situation abroad still continues quiet, with the exception that there is a good demand for washed nuts, which have risen sharply in price during the past fortnight, although the present figure of 21s. 6d. f.o.b. Hull is rather low. Hards remain firm in the neighbourhood of 23s. f.o.b., with furnace coke at 22s. 6d., and gas coke, with a discounting tendency for the best brands, 30s. f.o.b. Hull.

Prices at Hull at the week-end were: Bunkers—Yorkshire, Derby, and Notts, large screened steam, f.o.b. Humber ports, 17s. 6d. to 20s. per ton. Cargo for export, f.o.b. usual shipping ports: Best Yorkshire hards, Association, 22s. 7½d.; Derby best hards, 22s. 6d. to 23s. 6d.; West Yorkshire Hartleys, 18s. 6d. to 22s.; South Yorkshire washed doubles, 21s.; ditto, singles, 20s.; dry doubles, 15s to 16s.; South Yorkshire washed smalls, 16s. 6d. to 17s.; Derby slack, 1 in., 11s. to 12s.; South Yorkshire rough slacks, 11s. 6d. to 12s. 6d.; gas coke, 28s. 3d. to 31s. 6d.; foundry furnace coke, 22s. 9d.; washed smithy peas, 24s. 6d. to 26s.; washed steam thirds, 19s. 9d.; and South Yorkshire washed trebles, 22s. 6d. per ton

**Hot-Water Supply for London County Council Houses.**—Reference was made in last week's "JOURNAL" (p. 738) to the report of the Housing Committee, in which it was suggested that in the next block of dwellings erected by the London County Council an experimental installation for constant hot water should be provided. When the report came before the Council last week it was received and adopted without comment.

## CURRENT SALES OF GAS PRODUCTS.

### The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Dec.* 15.

Pitch maintains a decidedly firm tendency, although the amount of business reported is not large. The price is steady at from 52s. 6d. to 55s. per ton in bulk at makers' works.

Creosote continues in demand and is firm at from 6¾d. to 6½d. per gallon, although it is said that in some directions higher figures have been suggested.

Solvent naphtha, 95/160, stands at about 1s. 8d. per gallon; while pure toluole and pure benzole are from 1s. 11d. to 2s. per gallon net.

There are no other changes to record.

### Tar Products in the Provinces.

*Dec.* 15.

Prices for tar products are unchanged.

While there has been no actual alteration in the price of pitch, the market is decidedly quieter, and Continental buyers appear to be holding off for the moment. It is possible that there will not be any contracts of importance settled until the turn of the year.

Creosote is very firm indeed, and the demand from America continues.

Water-white products are still firm. Benzole is decidedly scarce, while solvent naphtha is fetching improved prices.

Anthracene is very dull indeed. The production in this country appears to be in excess of the demand. Naphthalene is quiet. Crude is fetching very poor prices, while as regards refined the makers are feeling the severe Continental competition.

Crystals carbolic is still neglected. English makers are finding it almost impossible to compete with German quotations. Crude carbolic in consequence is neglected; while there is little or no demand for cresylic acid.

The average values for gas-works products during last week were: Gas-works coal tar, 31s. 6d. to 36s. 6d. Pitch, East Coast, 50s. to 52s. 6d. f.o.b. West Coast—Manchester, 46s. 6d. to 47s. 6d.; Liverpool, 48s. to 49s.; Clyde, 50s. to 51s. Benzole 90 p.ct., North, 1s. 4d. to 1s. 5d.; crude 65 p.ct. at 120° C., 9¾d. to 10¼d. naked at makers' works; 50-90 p.ct. naked, North, 1s. 2d. to 1s. 3d. Toluole, naked, North, 1s. 4d. to 1s. 5d., nominal. Coal tar crude naphtha in bulk, North, 7¾d. to 8d. Solvent naphtha, naked, North, 1s. 4d. to 1s. 6d. Heavy naphtha, North, 1s. 1d. to 1s. 2d. Creosote, in bulk, North, liquid, 5⅞d. to 5¾d.; salty, 5¼d. to 5⅛d.; Scotland, 5⅞d. to 5¼d. Heavy oils, in bulk, North, 6¾d. to 7d. Carbolic acid, 60 p.ct., 1s. 7d. to 1s. 8d. prompt. Naphthalene, £13 to £15; salts, £4 to £7. bags included. Anthracene, "A" quality, 3½d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

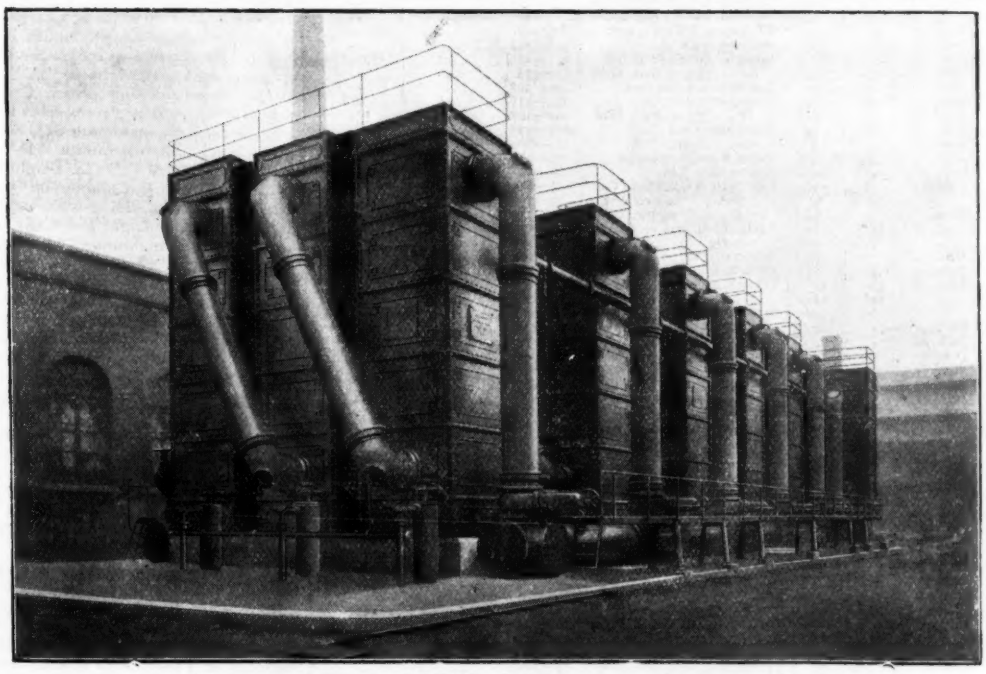
## Aldershot Council and Gas Company Agree.

Mention was made in the "Journal" for Oct. 29 (p. 300) of the fact that differences between the Aldershot Borough Council and the Aldershot Gas, Water, and District Lighting Company had been amicably settled, and that litigation between the two bodies had come to an end. Acknowledgment was made of the services that had been rendered in arriving at this settlement by Mr. R. W. Edwards (Chairman and Managing Director of the Gas Company), Mr. N. Clinton (the Company's local Solicitor), and the Town Clerk. When at their last meeting the Council's seal was set to the agreement, it was mentioned that the litigation thus ended had been in progress for some years, and the Deputy Mayor (Alderman H. Ainger, J.P.) said that "peace had been obtained without selling principle." The agreement deals with claims regarding filling-in trenches and reinstating roads, and the discharge by the Company of liquids into the Corporation's sewers under certain conditions. The Corporation give the following undertaking: "The Borough Council will not in repairing their roads use such rollers and other things to repair their roads as to cause damage to the Company's existing pipes, valves, or the like, without either giving the notices under section 153 of the Public Health Act, 1875, to have the level of the same altered and the depth at which they are laid increased, or without giving such pipes, valves, and the like, adequate protection. And, further, that should any of the Company's existing pipes, valves, and the like, be damaged by the Borough Council, they, the Borough Council, will bear the cost of repairing the same."

**Reduction in Price of Gas at Stafford.**—At a recent meeting, the Stafford Gas Committee recommended that the price of gas to all quarterly and prepayment consumers should be reduced by 2d. per 1000 c.ft., as from Jan. 1 next; the actual reduction being made in respect of the meter readings in the March quarter, 1925. Alderman P. J. Young, Chairman, was sure the Council would congratulate the Gas Manager (Mr. T. H. Poulson) on such an excellent result.

**Fire at the Blyth Gas-Works.**—Last Sunday week, at about 8 a.m., the holder which the Blyth Gas Company use for supplying gas to the town and district was inadvertently overfilled while changing-over to different holders. Consequently a certain amount of gas was allowed to "blow" fairly heavily for a short time. The escaping gas by some means became ignited, and caused a rather alarming position for a few moments. The damage to the holder does not appear to be of serious extent, but this can only be ascertained at a later period when interior examination will be permissible. The supply of gas to the town and district was not in any way interrupted; as a matter of fact the holder was submerged, and the escaping gas stopped, before the arrival of the fire brigade.

LATEST IMPROVEMENTS—"BEARSCOT" TUBES—MADE IN ALL SIZES.



DEMPSTERS' WATER COOLED CONDENSERS.
CAPACITY "20 MILLION" CUBIC FEET OF GAS PER DAY.

R. & J. DEMPSTER, LTD., MANCHESTER.
LONDON OFFICE: 34, VICTORIA STREET, WESTMINSTER, S.W.1.

# STOCK MARKET REPORT.

THE triumphant success of the Greek Loan was the feature of the past week. It is rumoured that one syndicate alone made application for over six times the amount of the issue. At the time of writing, the method of allotment that will be adopted is not known, but the preliminary announcement that applications for £2000 and under will not participate, has brought considerable criticism and a stream of protests from the smaller applicants.

The opening of Parliament had little effect on the Stock Markets, gilt-edged stocks especially. Colonial issues were somewhat depressed. The demand for increased wages from the National Union of Railwaymen caused Home Rails to sag, but Metropolitans, on the renewal of the rumours of absorption, improved slightly.

Attention has been drawn to the high prices being paid for the more popular Industrial shares. Calculating the yield on the dividends paid for 1923, the return in a number of cases is little over 5 p.ct., while in the case of two companies—Fine Cotton Spinners and General Electric—it is under 5 p.ct. The confidence displayed must be gratifying to the undertakings concerned, and it is hoped that investors will not have cause, on the publication of the accounts for 1924, to regret their optimism.

In the Gas Market prices generally were maintained. There was a slight setback in the Gas Light ordinary; but it will be noticed that the Plymouth and Stonehouse 5 p.ct. recovered the drop of 2 points upon which we commented last week.

The following transactions were recorded during the week:

On Monday, Aldershot 4 p.ct. preference 73½, Alliance and Dublin 65⅝, 65⅝, British 117¾, Commercial 3½ p.ct. 94½, Continental Union 36, European 8, Gas Light and Coke 95, 95⅛, 95¼, 95½, 95⅝, 95¾, 3½ p.ct. maximum 62, 4 p.ct. preference 81, 3 p.ct. debenture 61, 61¾, Imperial Continental 175, Primitiva 4 p.ct. debenture 1911 61½, South Metropolitan 100¾, 101, South Suburban 5 p.ct. 107¼, 109½, Tottenham "B" 103, Uxbridge Maidenhead Wycombe 5 p.ct. preference 97, Wandsworth (Wimbledon) 118½. Supplementary prices, Colonial Association 5 p.ct. debenture 71¾, 72, South Suburban 7 p.ct. debenture 105¾.

On Tuesday, Bombay 5½, Brentford "B" 114, 115, Commercial 3 p.ct. debenture 57¾, Gas Light and Coke 95½, Primitiva 8s. 6d., 8s. 9d., 9s., San Paulo 6 p.ct. preference 7 9/16, South Metropolitan 100¾, South Suburban 5 p.ct. 108, 5 p.ct. debenture 99.

On Wednesday, Aldershot 4 p.ct. preference 74, Alliance and Dublin 66, Commercial 4 p.ct. 95, Continental Union 7 p.ct. preference 92½, 93, Croydon sliding-scale 104, European 8½, 8½, Gas Light and Coke, 95, 95¼, 95⅜, 95⅝, 95¾, 3½ p.ct. maximum 63½, 3 p.ct. debenture 62½, Imperial Continental 176½, 177, 178½, 179, Plymouth and Stonehouse 5 p.ct. 114½, 115, Primitiva 4 p.ct. debentures 78, 78¼ *ex* div., South Metropolitan 100, 101½, 6½ p.ct. debenture 104½, 105½, South Suburban 5 p.ct. 108, 108⅛, 109, 5 p.ct. debenture 99½, Tottenham "B" 102½.

On Thursday, Bournemouth "B" 12⅝, Brentford "A" 114, "B" 114½, 115½, Brighton and Hove 174¼, British 116½, Commercial 4 p.ct. 94½, 96, Croydon 103½, 104, maximum dividend 86, 86½, European 8, Gas Light and Coke 95, 95⅝, 4 p.ct. preference 80, Imperial Continental 177, 178½, Primitiva 8s. 6d., 8s. 9d., 8s. 9¾d., South Barracas, 3d., South Metropolitan 100½, South Suburban 5 p.ct. 108¼, Tottenham "A" 119, "B" 102½. Supplementary prices, Croydon 6 p.ct. debenture 102, 103, 7 p.ct. debenture 105, 106, Swansea 5 p.ct. maximum 85½, 86.

On Friday, Bournemouth "B" 12¾, Brentford "A" 114, "B" 114, Brighton and Hove 175, British 116½, Commercial 3 p.ct. debenture 60, Croydon sliding-scale 103¾, maximum dividend 87, Gas Light and Coke 95, 95¼, 95⅜, 95½, 3½ p.ct. maximum 63, Imperial Continental 177, Primitiva 8s. 7½d., 8s. 9¾d., 9s. 1¾d., South Metropolitan 101, 101¼, 6½ p.ct. debenture 108¼, 109, 109½, Swansea 6½ p.ct. debenture 105½, Tottenham "B" 100½, Tuscan 25s., Wandsworth 3 p.ct. debenture 60½, 61. Supplementary prices, Town of Dudley 7 p.ct. debenture 106.

In the Money Market, conditions generally were on the quiet side. Loan rates were comparatively easy; but at the end of the week the usual relaxation was not apparent, and rates were maintained. The placing of £3,000,000 of New South Wales three months' Bills at a discount of 3¾ p.ct. was an unusual event. Treasury Bills averaged £3 13s. 5·98d. p.ct.

The feature of the Foreign Exchange Market was the advance in the value of the dollar-sterling, which on Tuesday touched 4·71¾. This high rate was, however, not maintained, and the price gradually fell, until it closed on Saturday at 4·69⅝. The French exchange was firm at 87·77½. Belgian francs closed at 95·30. Indian rupees appreciated slightly, the average being just over 1s. 6d. Argentine dollars closed lower at 44 29/32d.

Silver improved on the week and closed at 33 1/16d. per oz.

The Bank rate is 4 p.ct., to which it was raised from 3 p.ct. on July 5, 1923. Bankers' deposit rates are 2 p.ct. The deposit rates of the discount houses are 2 p.ct. at call and 2¼ p.ct. at notice.

| Issue. | Share. | When ex-Dividend. | Dividends. Prev. Hf.Yr. | Dividends. Last Hf. Yr. | NAME. | Quotations. Dec. 12. | Rise + or Fall − on Week. | Transactions Lowest and Highest Prices. |
|---|---|---|---|---|---|---|---|---|
| £ | | | % p.a. | % p.a. | | | | |
| 171,978 | Stk. | Aug. 14 | 5 | 5 | Aldershot 5 p.c. max. C. | 80—83 | .. | .. |
| 235,492 | ,, | ,, | 4 | 4 | Do. 4 p.c. Pref. | 72—77 | .. | 73¼—74 |
| 1,551,868 | ,, | Sept. 25 | 6 | 6½ | Alliance & Dublin Ord. | 64—69 | .. | 65⅝—66 |
| 374,000 | ,, | July 10 | 4 | 4 | Do. 4 p.c. Deb. | 63—68 | .. | .. |
| 300,000 | 5 | Oct. 23 | 8 | 8 | Bombay, Ltd. | 5—5¼ | .. | 5¼ |
| 100,000 | 10 | Aug. 14 | 8¼ | 8¼ | Bournemouth 5 p.c. | 12¼—13¼ | .. | .. |
| 425,050 | 10 | | 7 | 7 | Do. B 7 p.c. | 12¼—13 | .. | 12¼—12⅝ |
| 150,000 | 10 | ,, | 6 | 6 | Do. Pref. 6 p.c. | 10¼—11¼ | .. | .. |
| 50,000 | Stk. | June 26 | 3 | 3 | Do. 3 p.c. Deb. | 57—60 | .. | .. |
| 162,025 | ,, | ,, | 4 | 4 | Do. 4 p.c. Deb. | 77—80 | .. | .. |
| 992,043 | ,, | July 10 | 6 1/10 | 6 1/10 | Brentford A Con. | 114—119 | .. | 114 |
| 990,500 | ,, | ,, | 6⅛ | 6⅛ | Do. B New | 114—119 | .. | 114—115 1/2 |
| 76,000 | ,, | ,, | 5 | 5 | Do. 5 p.c. Pref. | 89—94 | .. | .. |
| 306,690 | ,, | June 12 | 4 | 4 | Do. 4 p.c. Deb. | 75—80 | .. | .. |
| 181,337 | ,, | ,, | — | 6 | Do. 6 p.c. Rich. Red. Deb. | 100—105 | .. | .. |
| 214,740 | ,, | Aug. 28 | 11½ | 11½ | Brighton & Hove Orig. | 170—175 | .. | 174½—175 |
| 244,200 | ,, | ,, | 8½ | 8½ | Do. A Ord. | 124—128 | .. | .. |
| 1,287,500 | ,, | July 24 | 5 | 5 | Bristol 5 p.c. max. | 92¼—93¼*a* | .. | .. |
| 855,000 | ,, | Sept. 25 | 7 | 8 | British Ord. | 115—120 | .. | 116½—117½ |
| 100,000 | ,, | June 26 | 7 | 7 | Do. 7 p.c. Pref. | 125—130 | .. | .. |
| 120,000 | ,, | ,, | 4 | 4 | Do. 4 p.c. Red. Deb. | 72—77 | .. | .. |
| 100,000 | 10 | May 22 | 6 | 8 | Cape Town, Ltd. | 7—8 | .. | .. |
| 100,000 | 10 | Nov. 6 | 4½ | 4½ | Do. 4½ p.c. Pref. | 6—7 | .. | .. |
| 150,000 | Stk. | June 26 | 4½ | 4½ | Do. 4½ p.c. Deb. | 72—77 | .. | .. |
| 626,860 | ,, | July 24 | 6 | 6 | Cardiff Con. Ord. | 97—100 | .. | .. |
| 237,860 | ,, | June 26 | 7½ | 7½ | Do. 7½ p.c. Red. Deb. | 103—106 | .. | .. |
| 157,150 | ,, | Aug. 14 | 6½ | 5 | Chester 5 p.c. Ord. | 86—91*b* | .. | .. |
| 1,513,280 | ,, | July 24 | 6 | 6 | Commercial 4 p.c. Cap. | 94—97 | .. | 94½—96 |
| 560,000 | ,, | ,, | 6 | 6 | Do. 3½ p.c. Cap. | 9·—97 | .. | 94½ |
| 475,000 | ,, | June 12 | 3 | 3 | Do. 3 p.c. Deb. | 58—61 | .. | 57½—60 |
| 800,000 | ,, | 14 Jan. 15 | — | — | Continental Union, Ltd. | 35—40 | −2 | 36 |
| 200,000 | ,, | June 12 | 7 | 7 | Do. 7 p.c. Pref. | 89—94 | .. | 92½—93 |
| 660,000 | ,, | Aug. 28 | 6½ | 6½ | Croydon sliding scale | 102—105 | +1 | 103½—104 |
| 284,975 | ,, | ,, | 5 | 5 | Do. max. div. | 84—87 | .. | 86—87 |
| 492,270 | ,, | Aug. 28 | 9 | 6 | Derby Con. | 107—110*c* | .. | .. |
| 55,000 | ,, | July 10 | 4 | 4 | Do. Deb. | 74—76*c* | .. | .. |
| 1,002,180 | 10 | July 24 | 2 | 6 | European, Ltd. | 8—9 | .. | 8—8½ |
| 16,503,045 | Stk. | Aug. 14 | 5½ | 5½ | Gas Light & Coke 4 p.c. Ord. | 94½—96½ | −½ | 95—95⅞ |
| 2,600,000 | ,, | ,, | 3½ | 3½ | Do. 3½ p.c. max. | 61—64 | .. | 62—63½ |
| 4,062,235 | ,, | ,, | 4 | 4 | Do. 4 p.c. Con. Pref. | 79—81 | .. | 80—81 |
| 4,761,930 | ,, | June 12 | 3 | 3 | Do. 3 p.c. Con. Deb. | 60—63 | .. | 61—62½ |
| 130,000 | ,, | — | 10 | 10 | Do. 10 p.c. Bonds | .. | .. | .. |
| 42,000 | ,, | — | 7½ | 7½ | Do. 7½ p.c. Ilford Deb. | .. | .. | .. |
| 82,500 | ,, | Sept. 11 | 6⅝ | 6⅝ | Hastings & St. L. 5 p.c. Conv. | 95—100 | .. | .. |
| 258,740 | ,, | ,, | 5⅛ | 5⅛ | Do. 3½ p.c. Conv. | 75—80 | .. | .. |
| 70,000 | 10 | Sept. 25 | 10 | 10 | Hongkong & China, Ltd. | 16—17 | .. | .. |
| 86,600 | Stk. | Aug. 14 | 10 | 10 | Hornsey 7 p.c. | 138—143 | .. | .. |
| 1,976,000 | ,, | Nov. 20 | 30 | 10 | Imperial Continental Cap. | 175—180 | +1 | 175—179 |
| 263,950 | ,, | Aug. 14 | 3½ | 3½ | Do. 3½ p.c. Red. Deb. | 70—73 | .. | .. |
| 235,242 | ,, | Aug. 14 | 6½ | 6½ | Lea Bridge 5 p.c. Ord. | 97—102 | .. | .. |
| 2,127,340 | ,, | Aug. 14 | 5½ | 5½ | Liverpool 5 p.c. Ord. | 91¼—91½*b* | +½ | 91½ |
| 600,000 | ,, | Sept. 25 | 7 | 7 | Do. 7 p.c. Red. Pref. | 104—107*b* | .. | 104 |
| 165,736 | ,, | Aug. 28 | 8 | 9 | Maidstone 5 p.c. Cap. | 125—135 | .. | .. |
| 63,480 | ,, | June 26 | 3 | 3 | Do. 3 p.c. Deb. | 55—60 | .. | .. |
| 75,000 | 5 | Dec. 4 | 7 | 5 | Malta & Mediterranean | 3½—3¾* | .. | .. |
| 541,920 | Stk. | Nov. 20 | 4 | 4 | Montevideo, Ltd. | 60—65 | .. | .. |
| 1,875,892 | ,, | July 24 | 5½ | 5 | Newcastle & Gateshead Con. | 83½—84*d* | .. | 84 |
| 250,166 | ,, | ,, | 4 | 4 | Do. 4 p.c. Pref. | 74—75*d* | .. | .. |
| 529,705 | ,, | June 26 | 3½ | 3½ | Do. 3½ p.c. Deb. | 69—71*d* | .. | .. |
| 15,000 | 10 | Aug. 28 | 11 | 11 | North Middlesex 10 p.c. | 16—17 | .. | .. |
| 75,940 | 10 | ,, | 7 7/10 | 7 7/10 | Do. 7 p.c. | 11½—11¾ | .. | .. |
| 300,000 | Stk. | Dec. 4 | 7 | 9 | Oriental, Ltd. | 98—101* | .. | .. |
| 138,120 | ,, | June 26 | 7⅛ | 7⅛ | Plym'th & Ston'house 5 p.c. | 112—117 | +2 | 114½—115 |
| 60,000 | 50 | Aug. 28 | 13 | 13 | Portsea Island B | 99—102 | .. | .. |
| 100,000 | 50 | ,, | 12 | 12 | Do. C | 95—100 | .. | .. |
| 2,289,909 | 1 | — | — | — | Primitiva Ord. | 8/6—9/6 | +/6 | 8/6—9/1¼ |
| 311,100 | 100 | Dec. 1 | 4 | 4 | Do. 4 p.c. Red. Deb. | 76—79* | .. | 78—78½ |
| 600,000 | Stk. | July 24 | 4 | 4 | Do. 4 p.c. Red. Deb. 1911 | 61—63 | .. | .. |
| 220,335 | ,, | June 26 | 4 | 4 | Do. B. Aires 4 p.c. Rd. Db. | 61—63 | .. | .. |
| 321,670 | ,, | ,, | 4 | 4 | Do. R'r P'te 4 p.c. Rd. Db. | 61—63 | .. | .. |
| 150,000 | 10 | Sept. 25 | 6 | 6 | San Paulo 6 p.c. Pref. | 7½—7¾ | .. | 7 9/16 |
| 125,000 | 50 | July 1 | 5 | 5 | Do. 5 p.c. Red. Deb. | 42—44 | .. | .. |
| 270,000 | Stk. | Aug. 28 | 5/8/4 | 5½ | Sheffield A | 103—105*e* | .. | .. |
| 419,968 | ,, | ,, | 5/8/4 | 5½ | Do. B | 103—105*e* | .. | .. |
| 1,047,000 | ,, | ,, | 5/8/4 | 5½ | Do. C | 103—105*e* | .. | .. |
| 90,000 | 10 | Oct. 23 | 8 | 6 | South African | 7—9 | .. | .. |
| 6,609,895 | Stk. | Aug 14 | 6½ | 5 | South Met. Ord. | 100—102 | .. | 100—101½ |
| 102,580 | ,, | July 10 | 5 | 5 | Do. Red Pref. | 98—100 | .. | .. |
| 1,895,445 | ,, | ,, | 3 | 3 | Do. 3 p.c. Deb. | 60—63 | .. | .. |
| 734,000 | ,, | Sept. 11 | 6½ | 6½ | Do. 6½ p.c. Red. Deb. | 104—106 | .. | 104½—105½ |
| 91,500 | ,, | Aug. 28 | 8½ | 8½ | South Shields Con. | 134—136*d* | .. | .. |
| 5,087,795 | ,, | Aug. 14 | 6½ | 6½ | South Suburban Ord. 5 p.c. | 107—112 | +2 | 107½—109½ |
| 368,837 | ,, | June 26 | 5 | 5 | Do. 5 p.c. Deb. | 95—100 | .. | 99—99½ |
| 647,740 | ,, | Nov. 6 | 5 | 5 | South'mpt'n Ord. 5 p.c. max. | 83—86 | .. | .. |
| 121,275 | ,, | June 26 | 4 | 4 | Do. 4 p.c. Deb. | 72—78 | .. | .. |
| 250,000 | ,, | Aug. 28 | 7 | 7 | Swansea 7 p.c. Red. Pref. | 102—104 | .. | .. |
| 200,000 | ,, | June 26 | 6½ | 6½ | Do. 6½ p.c. Red. Deb. | 104—106 | .. | 105½ |
| 120,000 | ,, | July 24 | 8 | 8 | Tottenham District A 5 p.c. | 118—121 | .. | 119 |
| 882,275 | ,, | ,, | 6½ | 6½ | Do. B 3½ p.c. | 102—105 | .. | 100½—103 |
| 181,255 | ,, | June 12 | 4 | 4 | Do. 4 p.c. Deb. | 76—80 | .. | .. |
| 258,251 | ,, | Aug. 28 | 7/14/4 | 5 | Tynemouth Con. and New | 84—86*d* | .. | .. |
| 187,294 | ,, | Aug. 28 | 6½ | 6½ | Uxbridge, Maidenhead, & Wycombe 5 p.c. | 102—107 | .. | .. |
| 68,330 | ,, | Aug. 28 | — | 5 | Do. 5 p.c. pref. | 95—100 | .. | 97 |
| 91,800 | ,, | — | — | — | Do. 5 p.c. Maidenh'd | 100—105 | .. | .. |
| | | | | | Wandsworth, Wimbledon, and Epsom— | | | |
| 30,000 | ,, | July 10 | 9½ | 9½ | Wandsworth A 5 p.c. | 140—145 | .. | .. |
| 255,636 | ,, | ,, | 7½ | 7½ | Do. B 3½ p.c. | 120—125 | .. | .. |
| 108,075 | ,, | ,, | 6/7/9 | 6/9/6 | Do. C | 102—107 | .. | .. |
| 240,865 | ,, | ,, | 6/7/9 | 6/9/6 | New Ordinary | .. | .. | .. |
| 352,000 | ,, | ,, | 7½ | 7½ | Wimbledon 5 p.c. | 116—121 | .. | 118½ |
| 98,000 | ,, | ,, | 7½ | 7½ | Epsom 5 p.c. | 122—127 | .. | .. |
| 80,416 | ,, | June 26 | 3 | 3 | 3 p.c. Deb. | 58—61 | .. | 60½—61 |

Quotations at—*a*.—Bristol. *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. * Ex. div.

## TRADE NOTES.

**Edward Le Bas & Co.**

Intimation has been received that on Jan. 1 next the tube and fittings business of the Company will be carried on under the title of the Le Bas Tube Company, Ltd., Dock House, Billiter Street, E.C. 3.

**The Blakeborough Valve Factory.**

One of a series of articles under the heading of "The Workshops of Great Britain," in the pages of "The British Engineer's Export Journal," deals with the Woodhouse Works, Brighouse, of Messrs. J. Blakeborough & Sons, Ltd. (who are associated with Messrs. George Kent, Ltd.). This article, which appeared in the October issue, describes the magnitude of the firm's operations in the manufacture of valves, and what is said in this respect is borne out by the reproduction of a number of photographs of the works. The largest and the smallest valves made by the firm are illustrated—the respective bores being 94 in. and ⅛ in.

**J. & W. B. Smith's Supplementary List.**

A useful up-to-date priced supplement (List G.187) to their general catalogue has just been issued by Messrs. J. & W. B. Smith, Ltd., of Nos. 15 to 23, Farringdon Road, London, E.C. 1. Upon the numerous profusely illustrated pages are shown the firm's well-known "Glasmi" burners and "Silva" lamps for both indoor and outdoor lighting. In addition to mantles, there is also included a large selection of small brass fittings, together with artistic brackets and pendants for inverted burners. The Company's fittings, it is mentioned, are all British made from solid drawn tubes; while all cocks have washer niting. Glass globes, bowls, and bead and silk shades are illustrated in great variety. The firm specialize in electro-plating and relacquering; these processes being carried out on their own premises by thoroughly equipped up-to-date plant.

**Bennis Chain Grate Stokers.**

A new type of chain grate stoker installed by Messrs. Ed. Bennis & Co., Ltd., of No. 28, Victoria Street, London, S.W., for the Cwmaman Coal Company, Ltd., is fitted with a narrow link which in practice has proved highly successful. Its advantages generally are that, owing to the larger air space area, it is possible to burn about 20 p.ct. more fuel per square foot of grate than on other makes with a correspondingly increased boiler duty. The efficiency generally is also increased by the better combustion of the fuel, and the life is reported to be substantially longer than that of other types of links. The increased evaporation on the test boiler fitted with this stoker over five forced-draught hand-fired boilers, on two days when tests were carried out, amounted to 67 and 62 p.ct. respectively. The coal used was ordinary Cwmaman unwashed colliery rough small, being of the dry steam coal variety, with a volatile of about 9 p.ct., and containing from 16·5 to 22·5 p.ct. of ash.

## CONTRACTS OPEN.

**Gasholder Repairs and Addition.**

Tenders are invited by the Newbury Corporation for repairing, and adding an additional lift to, a two-lift gasholder. [See advertisement on p. 803.]

**Vertical Retort Brickwork.**

The Arbroath Gas Corporation are asking for tenders for the renewal of the brickwork of two ovens of vertical retorts. [See advertisement on p. 803.]

## EXTENSIONS.

**New Retorts for South Molton.**

Owing to the increased consumption of gas at South Molton the Gas Manager (Mr. A. Braddick) recommended the erection of a bench of six retorts in a shed adjoining the present retort-house, at a cost of about £980. The report was referred to the Gas Committee.

At a meeting of the Redcar Town Council last week, it was decided to purchase a 2½ acre site close to the gas-works. It was reported that the new gasholder was almost completed, and would be in use by the middle of the present month.

A slight outbreak of fire occurred at the Halifax Corporation Gas-Works on the 10th inst. It was found that some supports of a coke conveyor had become ignited; but owing to the quick discovery, and the sharp attendance of the fire brigade, very little damage was done.

Mr. J. A. Richmond presided last Wednesday, at the Duke of Cornwall Hotel, over the first annual dinner of the Plymouth and Stonehouse Gas Company's Bowling Club; others present including Messrs. J. H. Ellis (President), P. S. Hoyte, G. H. Bolton, and J. W. Walters. Messrs. W. G. Hayward and A. Router won the President's prizes, Mr. Hayward also taking the members' special prize. For their kindness to members during the season, Mrs. R. Taylor and Mrs. A. Lugg were presented with handbags. There was an enjoyable musical programme.

*Now in the Press.*

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**THE "JOURNAL" DIARY AND GAS CALENDAR, 1925.**

The book (in handy size for the pocket) has been written and compiled by Dr. W. B. DAVIDSON, who is well known as a scientific authority in the Gas Industry. It is a compendium of valuable information for Gas Engineers on both sides of the Industry, and will therefore be a constant companion. It also (in addition to the Diary) incorporates a list of the Gas Undertakings of Great Britain and Ireland, with the latest particulars as to make, calorific value (declared and supplied) or illuminating power, &c.

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*Ready Friday, Dec. 19.*

FOR GAS SALESMEN.

**THE "GAS SALESMAN'S" DIARY AND HANDBOOK, 1925.**

The "Useful Information" for Gas Salesmen has been revised throughout and largely extended. It now includes sections dealing with the "N.G.C." Cooker, the Gas Consumption of Different Appliances for both domestic and industrial use, and the Flow of Gas in Pipes. Information regarding the "Standard" Meter has been considerably amplified; and the whole is accompanied by a Complete Index. A Limp Cover with flush edges, rounded corners and back, greatly improve this year's Diary.

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### CHRISTMAS HOLIDAY.

**In consequence of the Christmas Holiday, all communications for the next issue of the "JOURNAL" should reach the office not later than the first post on Monday, Dec. 22.**

**UNDISPLAYED ADVERTISEMENTS; Situations Wanted, Six Lines and under (about 36 words), 3s.; each additional Line, 6d. Situations Vacant, Apparatus Wanted and for Sale, Contracts, Public Notices, &c., 9d. per Line—minimum, 4s. 6d.**

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